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AN

ESSAY

TOWARDS A

RATIONAL SYSTEM of MUSIC.

By JOHN HOLDEN.

——————— Muſic ——
To which reſpondent ſhakes the varied ſoul.
THOMSON.

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TO

His Grace WILLIAM, Duke of MONTROSE, etc.
Chancellor of the University of Glasgow,
Sir ADAM FERGUSSON, of KILKERRAN, Baronet,
Lord Rector,
The Reverend Mr. JOHN CORSE, Dean of Faculties;
and to
Doctor WILLIAM LEECHMAN, Principal,
And all the PROFESSORS of Glasgow College;
PATRONS of useful and polite LITERATURE;

This ESSAY is humbly inſcribed,

by their moſt obedient Servant,

JOHN HOLDEN.

PREFACE.

THE deſign of the following Treatiſe is to explain, in a rational and familiar way, and to diſpoſe, in a ſyſtematic order, thoſe particulars with which every one ought to be acquainted, who deſires either to perform Muſic with propriety and ſpirit, or to hear it with judgment and taſte; and therefore I have intitled it, AN ESSAY TOWARDS A RATIONAL SYSTEM OF MUSIC.

HAVING hit upon ſeveral new obſervations, which, according to the opinions of the beſt judges in Muſic, whom I could conſult, deſerved to be communicated to the PUBLIC; and conſidering alſo, that many valuable improvements, lately made in this ſcience by foreign authors, and particularly by the French, had not yet made their appearance, in an intelligible form, in our own language, I was irreſiſtibly conſtrained to attempt this taſk, however unqualified for it.

THE plan of this work was formed ſeveral years ago, and the ſucceſſive chapters printed off at different times, as they could be got ready; for I found a neceſſity of giving ſome months attention, at all leiſure hours, to every particular ſubject, in order to bring them to that ſtate, imperfect as it is, in which they now appear.

I SHALL therefore make no other apology for the faults of the following Piece than this, which ſeems to be the only proper one an author can make, *I have done my beſt:* and as I have had occaſion to enter into ſome enquiries where abſolute certainty is hardly to be expected, ſo I am equally prepared to enjoy the approbation of the judicious, ſo far as I am right; or to profit by their candid corrections, where I may be wrong.

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⁂ A juſt ſenſe of the reſpect due to the Public, conſtrained the Author to overſee and correct the printing of this treatiſe with more than ordinary care, ſo that there is not one typographical error which can obſcure the ſenſe, except the following, which the reader is requeſted to correct, *viz.*

Art. 207. l. 1. for *regular* read *irregular*.

PART I.

The RUDIMENTS of PRACTICAL MUSIC.

CHAP. I. *Of the natural* SCALE *of* MUSIC.

Article 1. A SUCCESSION of ſeveral ſounds, properly qualified to excite agreeable ſenſations in the hearer, is called Muſic; and to underſtand muſic is to be able to define what are the proper qualities of ſounds for this purpoſe; and alſo to judge, when ſounds are heard, whether they have, or have not, theſe neceſſary qualifications.

2. The moſt obvious diſtinctions, among the ſounds of muſic, are thoſe of the tune or pitch of different ſounds, and of their time or duration: and theſe two articles of tune and time, as they are the moſt remarkable, ſo they are alſo the moſt important, and indeed the only things which a learner muſt endeavour to underſtand. — We ſhall firſt attempt to explain what a beginner ought to obſerve concerning the article of tune.

3. It is cuſtomary, in comparing together two ſounds of different degrees of tune, to call the ſhriller ſound, acuter or higher, and the other, graver or lower: thus a boy's voice is acuter or higher than a man's voice, and a baſs viol is graver or lower than a violin; and when a voice or inſtrument moves from a graver to an acuter ſound, we ſay it aſcends; and contrariwiſe, the motion from an acuter to a graver ſound, is called, deſcending. *

4. In this compariſon of the tune of ſounds, we do not conſider their different ſtrength or weakneſs; in regard to which they are called loud or ſtrong, and ſoft or weak; only the particular tone or pitch of each, ſo that the terms high and low relate to the pitch of ſounds, but loud and ſoft to their ſtrength.

5. In order to repreſent to the eye the different tune or pitch of ſounds, five parallel lines are drawn, and are called a ſtaff of lines; and the degrees of tune are ſhewn by the ſituations of certain characters upon theſe lines, or in the ſpaces between them. The character, which repreſents a higher ſound, has a higher place, and the lower ſound, a lower place in the ſtaff of lines.

6. There are certain ſteps or degrees of tune which conſtitute what is called the natural ſcale of muſic: and it is very remarkable, that among all the infinite variety which muſic affords, the ſame natural ſcale is always retained, and the ſame mutual relations, in regard to the pitch, exiſt among the ſeveral ſounds of every tune, how various ſoever they may be in other reſpects.

The ſucceſſive ſounds of a tune ſometimes aſcend or deſcend by the ſingle degrees or ſteps of the ſcale, and ſometimes by larger intervals or leaps, but always ſo as to pitch on ſome one or other of the degrees of this natural ſcale.

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* This remark appeared neceſſary, becauſe, in truth, the propriety of the terms high and low, when applied to the degrees of tune, has no foundation in the nature of ſound, and depends entirely upon cuſtom; and among the ancient Greeks, the graveſt tones were called high, and the acuteſt low: probably becauſe the longeſt and graveſt ſtrings of their lyres had the uppermoſt places.

Hence we may partly conceive the great importance of a thorough knowlege of this natural ſcale; it is indeed to muſic, what the alphabet is to ſpeech: for, as all the various articulations of ſpeech are denoted by a few letters, properly ranged; ſo all the different paſſages of muſic are only different arrangements of a few primitive ſounds of certain proper degrees of pitch.

7. Theſe ſteps of the natural ſcale are not all of equal ſize, but are ſome of them nearly * the double ſize of others; and therefore the larger ſteps are called, *tones;* and the ſmaller, *ſemitones.*

Now, the ſtep of a tone, not being any way viſibly diſtinguiſhed from that of a ſemitone, in the ſituation of the characters of our written muſic; becauſe, here each ſtep, whether greater or leſs, is denoted by an equal riſing or falling of the character, *viz.* from a line to the adjacent ſpace, or from a ſpace to the adjacent line: we have, therefore, the more occaſion to fix well in our memory which of theſe, ſeemingly equal ſteps, are to be eſteemed tones, and which ſemitones; that we may readily know what degree of ſound is really meant by each line and ſpace.

8. To determine the places of theſe tones and ſemitones, in the natural ſcale, we obſerve, that in ſinging the eight ſucceſſive notes, commonly called the aſcending Gamut, as repreſented, Pl. I. Exam. I. the voice, as to the pitch of the firſt note, is quite undetermined, and ready to fall in with any muſical ſound, which may be propoſed by any other voice or inſtrument, provided it be not above or below its compaſs; but after the tone or pitch of the firſt note is determined, it ſo influences and governs all the following notes, that each of theſe muſt bear its proper relation to the firſt, or elſe the ſucceſſion will be harſh and ſhocking inſtead of muſical.

This firſt note of the Gamut, which thus governs all the reſt, is called the Key note; and the following notes of the aſcending ſcale, are called, ſecond, third, fourth, fifth, ſixth, ſeventh, and ſo on, as ſhewn by the letter K, and the figures ſubjoined to each in Exam. I. †

9. Now, let the firſt four notes be ſung over, applying the ſame ſyllable, ſuppoſe *la,* to each note; a very little attention will ſerve to diſcover, that the voice, in paſſing from the third to the fourth note, does not take ſo large a ſtep, as it does from the key to the ſecond, or from the ſecond to the third: there is ſomething remarkably grave in the fourth note, which cannot eſcape the notice of the moſt unſkilful hearer, provided he hath a genius for muſic, and be previouſly warned of ſuch a property; although, without due attention to this and other ſuch like peculiarities, a perſon may ſing all his life, and yet never conceive the leaſt idea of the nature of the ſcale; much in ſame manner, as a perſon may uſe his faculty of ſpeech, without any knowlege of reading and writing.

The ſteps from the key to the ſecond, and from the ſecond to the third, are tones; and that from the third to the fourth, is a ſemitone.

10. Let the whole eight notes of the aſcending Gamut, Ex. I. be now ſung, and it will be eaſy to obſerve, that the voice takes a pretty large ſtep from the fourth to the fifth; and that the ſixth, ſeventh, and eighth notes follow the fifth in the ſame manner, and with the ſame air, in the latter half of the Gamut, as the ſecond, third, and fourth, followed the key in the former half: ſo that the Gamut naturally divides into two equal and ſimilar half-gamuts:

The firſt containing, the key, ſecond, third and fourth;
The latter containing, the fifth, ſixth, ſeventh and eighth:

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* We ſay *nearly*, becauſe, on ſearching further into the nature of muſic, it is found, that the ſemitone is not the exact half of a tone; but in common practice, it is ſuppoſed to be ſo, without cauſing any ſenſible error.

† In this Example, there are certain characters at the beginning of the ſtaff of lines, which the reader need not take any notice of at preſent; their meaning and uſe will be explained in a proper place.

And as the ſemitone lay betwixt the third and fourth, in the firſt half, (Art. 9.) ſo the ſemitone lies betwixt the ſeventh and eighth, in the latter half; and all the other degrees are tones.

The ſtep of a ſemitone is diſtinguiſhed in Exam. I. by a ſmall s over the notes.

11. As the ſituation of theſe tones and ſemitones cannot be too ſtrongly imprinted on the memory, we ſhall here deſcribe ſeveral different ways of conceiving the ſteps of the ſcale, ſome of which may probably ſuit one reader, and others another.

The ſteps of the aſcending Gamut are firſt two ſucceſſive tones, then a ſemitone; then three ſucceſſive tones, and then another ſemitone. Two ſucceſſive tones are called a ditone; and three ſucceſſive tones, a tritone: ſo that the aſcending ſcale is firſt a ditone, and a ſemitone; then a tritone, and a ſemitone. See Exam. II.

12. Each half of the Gamut, as deſcribed, Art. 10. is called a tetrachord; and in this way, the Gamut is compoſed of two disjoined tetrachords: the ſtep from the fourth to the fifth, being from the uppermoſt note of one tetrachord, to the loweſt of the other, is called, the *diazeuctic tone*, or tone of disjunction. See Exam. III.

13. The Italians and French apply the ſinging ſyllables, *ut*, *re*, *mi*, *fa*, *ſol*, *la*, *ſi*, *ut* *, to the eight notes of the Gamut, (ſee Exam. IV.) with great propriety; for, by this means, the ſteps from the third to the fourth, and from the ſeventh to the eighth, being from *mi* to *fa*, and from *ſi* to *ut*, are naturally ſung ſemitones; becauſe the ſyllables *mi* and *ſi*, partly oblige the ſinger to keep their ſounds more acute, while *fa* is a more open ſyllable, and requires a graver pronunciation, ſuitable to the ſound of the fourth note, Art. 9.

14. Our Britiſh muſicians uſe no more than four of theſe ſyllables, *viz.* *fa*, *ſol*, *la*, *mi*, which they apply to the notes of the ſcale, as ſhewn, Exam. V. where it may be obſerved that *mi*, which is appropriated to the ſeventh note, is the only ſyllable which occurs but once; *fa* anſwers to the key, the fourth and eighth; *ſol* is the ſecond and fifth, and *la* the third and ſixth; which is a great inconvenience, becauſe of the double meaning of our ſyllables; however, it is of uſe to remember this diſpoſition of the ſyllables, for underſtanding the authors who have wrote on the ſubject of muſic in our own language.

To aſſiſt the memory in this matter, our authors obſerve, that in aſcending above *mi*, we have *fa*, *ſol*, *la*, twice over; and in deſcending below *mi*, we have, *la*, *ſol*, *fa*, twice repeated, and then *mi* comes again. See Exam. VI.—and that the ſemitones always lie below the ſyllable *fa*.

15. Theſe methods of naming the degrees of the ſcale, by ſinging ſyllables, lead us to obſerve another property of ſounds, *viz.* that as the key, and the eighth, are both called by one name, ſo they are in reality, both of the ſame nature, and produce the ſame effect on the hearer; ſo that, when they are heard together, they ſeem to be both one and the ſame ſound. For inſtance, ſuppoſe a man and a boy were to begin to ſing the Gamut together, the boy would naturally give the ſame ſound to the firſt note, which the man arrives at in the eighth or laſt note; ſo that the boy's loweſt note would be the ſame with the man's higheſt; and yet the two would agree together ſo perfectly, that a hearer would ſcarce be able to diſtinguiſh any difference; whereas, if the boy were to begin his Gamut with any other ſound but this eighth, the diſagreement would be very perceivable, and in many caſes very offenſive. For another inſtance, ſuppoſe one man to ſing over the aſcending Gamut, and the very inſtant, when he arrives at the eighth, or uppermoſt ſound, another man begins at the key, or loweſt ſound; the firſt and laſt ſounds of the Gamut thus heard together, will ſeem but as one.

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* Inſtead of the ſyllable *ut*, they ſubſtitute *do* in practice, being more eaſy to pronounce: but as all the theoriſts retain the ſyllable *ut*, we have therefore kept it here; as one chief uſe of this article is to enable the reader to underſtand what the foreign authors mean by

This interval of ſound is called an *octave*; becauſe the upper is upon the eighth degree of the ſcale, when the lower is on the firſt, or key.

16. Now, when a man and a boy proceed to ſing the whole eight notes of the aſcending Gamut, the boy's voice begins, as before mentioned, an octave above the man's voice; and aſcending all along by the ſame ſteps, keeps always the ſame interval of diſtance between them, and comes at laſt to a ſound, as much above the man's laſt note, as this laſt is above the man's firſt. The boy's voice is ſtill an octave above the man's, and they perfectly agree together throughout the whole ſcale.

We infer from hence, that if a man's voice aſcend above the 8th, to a 9th, 10th, 11th and 12th ſound, etc. he muſt juſt make uſe of the ſame ſteps of the ſcale over again, becauſe the 8th ſound is in all reſpects like the former key; to which the 9th is a ſecond, the 10th a third, the 11th a fourth, the 12th a fifth, etc. that is, when we aſcend above the eighth, we come into the boy's Gamut, which is, in all reſpects, like the man's, but an octave higher. Thus alſo, if the boy were to deſcend below his firſt, or key note, he would come into the man's Gamut, and muſt therefore, next below the key, take the 7th, then the 6th, then the 5th, etc. each an octave lower.

17. This being the caſe, we have not, in the whole compaſs of muſic, any ſounds eſſentially different from thoſe which exiſt within the compaſs of one octave, which, as we have already ſeen, are *naturally* no more than ſeven: and the learner's buſineſs, in regard to the tune of ſounds, is brought within a much narrower compaſs than he probably may have expected. Let him obſerve and remember, that whatever ſound be conſtituted a key, it is always to be conſidered as the loweſt note of one Gamut, and the higheſt note of another; it is ſomething like a knot which connects the ſounds above with thoſe below it: and thus, how far ſoever we extend the ſcale of muſic, both upward and downward, it will ſtill be but a number of ſingle Gamuts, each conſiſting of eight ſounds, at the very diſtances above deſcribed; and the whole connected together, by making the eighth ſound of each Gamut to coincide with the firſt of that which is above it.

If a long train of notes be placed upon lines and ſpaces, as in Exam. VI. the learner will, as yet, be at a loſs to know which of them is to be eſteemed the key, or firſt note of his Gamut; as this depends upon the characters, and marks prefixed to each example; and their meanings are not to be underſtood, till ſome other particulars have been explained: but, ſuppoſing the place of the key note to be known; which is, in the former examples, upon the ſecond line, and here on the third ſpace *; the application of the K, and the numbers 2, 3, 4, etc. or, of the Britiſh ſinging ſyllables, *fa*, *ſol*, *la*, etc. or of the Italian ſyllables, *ut*, *re*, *mi*, *fa*, etc. will be very eaſy, if what is above ſaid be well underſtood.

This example is extended both upward and downward, beyond the compaſs of the uſual ſtaff of five lines, upon ſmall additional lines, which are occaſionally drawn for this purpoſe, and are called, leger lines. It will eaſily be ſeen, that inſtead of the number eight, as in the former examples, here comes a repetition of the key, agreeable to what is obſerved above. The Britiſh *fa*, and the Italian *ut*, always correſpond with the key, and the other ſyllables follow in order; and the places of the ſemitones, marked above with s, are according to the preceding rules.

18. Having thus eſtabliſhed the connexion of ſeveral Gamuts, in order to extend the ſcale of muſic at pleaſure, we may here add another rule for finding the places of the ſemitones, when the place of the key is known, which ſeems to be more ſimple,

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* In counting the lines and ſpaces of a ſtaff for muſic, we always begin at the bottom line, and call it the firſt; and the ſpace next above it, is called the firſt ſpace: and thus, the uppermoſt line is the fifth. This cuſtom, ſo contrary to that of counting lines, upon other occaſions, has probably been introduced in conformity to the manner of counting the degrees of the ſcale, which, as we have already ſeen, are always numbered upwards.

and more eaſily remembered than any of the foregoing, *viz.* obſerve the place of the key and of the third; *The ſemitones are always the next below the key, and the next above the third; and all the other degrees are tones.*

19. It will be uſeful to obſerve here, that as the Gamut was called two disjunct tetrachords, Art. 12.; ſo the upper tetrachord of each Gamut is connected with the lower tetrachord of that which lies above, by means of the key-note which is common to both; and thus the two half Gamuts, which lie on each ſide of the key, are conjunct-tetrachords; and the ſcale of muſic, extended at pleaſure, may be conceived as conſiſting of tetrachords disjunct and conjunct, alternately; the conjunctions being at every key note, and the disjunctions between every fourth and fifth.

For the better fixing of theſe ideas, it may alſo be remarked, that the disjunctive or *diazeuctic* tone is always the loweſt ſtep of the tritone, Art. 11. and that in the Italian ſyllables it is always from *fa* to *ſol,* Art. 13. The ſtep from *fa* to *ſol* in our Britiſh ſyllables, Art. 14. is ambiguous *.

We have deſignedly dwelt the longer on this explanation of the ſcale of muſic, both becauſe it is the foundation on which all our knowlege of the proper tune of ſounds muſt be built; and alſo, becauſe few or none of the authors who have condeſcended to write introductory treatiſes on muſic, ſeem to have ſufficiently inſiſted on this matter.

20. Beſides the reading and retaining what is paſt, we have now another taſk to impoſe on the learner: it is not enough to know ſpeculatively what name belongs to each note, and where the tones and ſemitones lie; but he muſt alſo know practically when he hears the ſounds themſelves, whether they be juſtly performed or not. Speculations here are of no uſe, only as far as they can be put in execution.

For this purpoſe, he muſt practiſe the aſcending and deſcending Gamut, as repreſented, Pl. I. Exam. VII. till the proper ſound of each note become quite familiar; and, if a mere beginner, he ought not to truſt altogether to his own ear and judgment, but ſeek all opportunities of the *accompanyment* of ſuch as are more expert; for it is a well known fact, that falſe and ill-tuned notes, by frequent uſe, will become tolerable; thus, by frequently hearing an ill-tuned ring of bells, or a falſe ſtopped violin, or ſome other muſical inſtrument injudiciouſly managed, many, poſſeſſed of good natural talents for muſic, have acquired bad habits of ſinging falſe, which have not been caſt off without the greateſt difficulty.

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* There is no doubt, but when our ſyllables were firſt reduced to four, it was done with an eye to the conſtitution of the ſcale by tetrachords: though according to the above-deſcribed poſition of the tetrachords, we find no manner of correſpondence between them and our ſyllables.

In defence of the arrangement of our ſyllables, it muſt be obſerved, that the tetrachord of the Greeks, from whom we borrow the name, was a different ſyſtem of ſounds from what is above deſcribed: theirs was firſt a ſemitone, then two tones; whereas ours is firſt two tones, and then a ſemitone: ſo that in applying the tetrachords of the Greeks to our ſcale, we muſt begin on our third and ſeventh notes; and ſuppoſe the conjunctions to be at every third, and the disjunctions between every ſixth and ſeventh; as will eaſily appear by inſpecting the ſcale, Exam. VI.

In this view we ſhall find the tetrachord to be *mi*, *fa*, *ſol*, *la*, conſtantly; only at the conjunctions, when the *mi* of one tetrachord coincides with the *la* of another; the *mi* is ſuppreſſed, and *la* is kept in its place: and thus the diazeuctic tone is from *la* to *mi*.

Had not the nature, or perhaps more properly, the ſpecies of our modern muſic, compelled us to acknowlege the other diviſion of the tetrachords much more obvious; we ſhould gladly have retained that which at once both correſponds with the ſyſtems of the ancients, and with our preſent ſinging ſyllables.

How far the ſpecies of the ancient muſic might tend to familiarize certain paſſages, which ſeem vaſtly unnatural to us at preſent, is hard to ſay. This we know, that we cannot, without conſiderable precaution, begin to ſing with any note, except the key; neither can we finiſh with any other: whereas the Greeks ſeem to have begun, where their tetrachord begins, *viz.* on the ſeventh.

If it be altogether owing to cuſtom, that we adopt a different ſcale from that of the ancients; that cuſtom is, to us, as inviolable as natural inſtinct; and therefore ought to be carefully attended to.

The greateſt of modern theoriſts have found the ſame neceſſity of relinquiſhing the ancient tetrachord. See M. D'Alembert's *Elemens de Muſique,* Part I. Chap. v. and vi.

The moſt proper time to guard againſt ſuch unnatural habits is at our firſt beginning; and one may almoſt venture to aſſert, that he who habitually ſings the Gamut perfectly true, will never after ſing any thing remarkably falſe.

A well tuned voice is, doubtleſs, the beſt accompanyment for a learner of vocal muſic, where ſuch can be procured; and it can ſeldom happen, that any who would learn to ſing, can be at a loſs for ſuch aſſiſtance: yet the learner need not confine himſelf in this reſpect, but may ſing along with any inſtrument without ſcruple, provided it be in a judicious hand.

21. Another caution, in regard to this practice, may be no leſs neceſſary; that the learner do not miſtake the main deſign for which it is recommended at this time. It is not ſo much for the ſake of acquiring a habit of performing the notes juſtly; but chiefly, that he may learn, as it were, to *feel* the difference between the ſtep of a tone and that of a ſemitone; and to perceive the different natures and effects of the different notes of the ſcale, according to their ſeveral relations, as 2d, 3d, or 4th, etc. to the key. He muſt not only learn to ſing or play the Gamut, but he muſt learn to know, in ſome meaſure, how he does it, and what it is when done.

There is ſomething peculiar in every note, which well deſerves our regard. The key note is remarkably bold and commanding; the third and ſeventh have ſomething ſupplicative in them: and it is on one of theſe tones which the beggar chiefly dwells, if he uſe any tone at all*: the ſixth is a kind of plaintive ſound; the fourth, as obſerved before, is grave and ſolemn; the fifth partakes of the nature of the key, and the ſecond is not unlike to the ſixth. It muſt be obſerved, that theſe properties are not inſeparable from the ſounds; but that the ſame ſound will have different effects, according to the different manners in which it is introduced: this will be better underſtood afterwards: we ſpeak here only of the moſt uſual properties of theſe ſounds, which depend on the perception of their ſeveral relations to the key note †.

22. It is obſervable, that the ſame peculiar property of ſound always correſponds with the ſame ſituation in every tetrachord of the ſcale, as deſcribed, Art. 12, and 19. The loweſt note of every tetrachord is bold and commanding; the next above is plaintive; the third of each tetrachord is ſupplicative; and the fourth, or higheſt note, is grave, except at the conjunctions, when it coincides with the loweſt of the next tetrachord: in which caſes, the ſound is rather conceived as the loweſt of the tetrachord above, than as the higheſt of that below.

From this ſimilarity of effect of the notes in every tetrachord, ariſes that ſimilarity of air in each half-gamut, deſcribed, Art. 10.; which is the ſole cauſe of our adopting this diviſion of the tetrachords, preferable to any other. See the note to Art. 19.

23. There is yet ſomething further to be obſerved in regard to the fourth note, which is not quite ſo grave a tone in the aſcending, as in the deſcending Gamut: this, the more expert muſician will readily perceive: and he who cannot at preſent, for want of practice, enter into the examination of ſuch minute differences, will yet arrive at the knowlege of them much ſoon-

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* The difference between a muſical tone and natural ſpeech, is very obvious. The tone is a ſound continuing for ſome time on the ſame degree of pitch; while the ſounds of natural ſpeech are perpetually varying; and, as it were, *ſliding* either upwards or downwards during the pronunciation of every ſyllable.

† It is plain, that if we were only to conſider muſical ſounds ſingly, without any regard to their relations to, or dependencies upon each other; no ſuch properties as theſe could be attributed to any one ſound more than another: we might indeed aſcribe different properties to the ſounds of different inſtruments; thus, the trumpet is bold, the violin is chearful, the baſſoon is ſolemn, etc. but then, in this view, all the ſounds of the ſame inſtrument are of one ſort.

er, by having them previouſly pointed out to him, at his firſt ſetting forward.

It is for this reaſon we diſtinguiſh the deſcending fourth, by the name of a grave fourth, and mark it with a grave accent (\) above the note in Exam. VII.

The compariſon of the two fourths, as they occur in Ex. VII. is pretty difficult, becauſe of the intervening notes: but if the firſt half of the aſcending Gamut, and the latter half of the deſcending Gamut be joined together, and ſung, as repreſented, Exam. VIII.; the difference of the two fourths, when thus brought together, will be more perceivable; and the hearer will eaſily obſerve, that the ſucceſſion is more muſical, when the latter fourth is made diſtinguiſhably graver than the former.

The difference here ſpoke of will be beſt perceived, when the ſucceſſion of ſounds is neither very quick nor very ſlow; and for a direction in this reſpect, let the names K. 2. 3. 4. 4. 3. 2. K. be applied to the notes, as ſubjoined in Exam. VIII.; giving each note as much time as is neceſſary for a diſtinct, but not rapid, pronunciation of the word; and making each of them as nearly of an equal length as poſſible.

Thus we have in reality two ſorts of fourths; although this diſtinction has, I believe, eſcaped the notice of all former writers on muſic: it is nevertheleſs a fact confirmed by the experience of the beſt performers; and a circumſtance not only of great importance in itſelf, but which alſo leads to the knowlege of ſeveral other uſeful, and hitherto intricate particulars.

24. All the other notes of the ſcale are the very ſame both in aſcending and deſcending; yet we have a reaſon for diſtinguiſhing the ſixths of the Gamut by the name of acute ſixths; as ſhewn by the acute accent (/) placed over them, in Ex. VII. becauſe, in other kinds of ſucceſſions, there frequently occurs another ſort of ſixth, which is diſtinguiſhably graver than theſe; and yet this other ſixth cannot ſo properly be called grave, as will be ſhewn hereafter.

This difference between the ſixths in different paſſages, although in reality, not ſo perceivable as that of the fourths above-mentioned, is obſerved by M. D'Alembert, in his *Elemens de Muſique*, Art. 63. and note (*o*), and by ſome other modern authors of the firſt rank; although neither the epithets *acute* and *grave*, nor any others equivalent, have been currently made uſe of for diſtinction, nor any new character admitted into our written muſic, for that purpoſe.

We have made choice of theſe accents to ſupply this defect; both becauſe their meanings are moſt univerſally known; and alſo, becauſe they can be very eaſily added with a pen, in any pieces of muſic already printed; and as eaſily ſupplied in cut plates of muſic, by all ſuch as judge them uſeful.

It is unqueſtionably an advantage, to have every difference which really exiſts among the ſounds of a tune, ſomeway viſibly repreſented in our written muſic; and without ſome ſuch diſtinguiſhing marks as theſe, the proper ſounds of the fourth and ſixth notes would often be dubious, and always depend on the taſte of the performer; whereas theſe marks take away all ambiguity, and bring the variable ſounds of the fourth and ſixth notes under as certain rules, as the other invariable notes of the ſcale.

25. All the foregoing remarks and directions concern every inſtrumental performer juſt as much as the vocal; although ſome of them may ſeem particularly addreſſed to the latter only. It is abſolutely neceſſary, that every muſician be well verſed in the nature of the ſcale, whether the ſounds he uſes be under the immediate direction of his ear and judgment, as with the voice and violin; or whether the ſounds be partly fixed, and yet capable of ſmall occaſional variations, as on the German flute; or whether they be, for the time, quite fixed and immutable, as on all key'd inſtruments.

A great part of our enjoyment of muſic is owing to the perception of certain due relations among the ſeveral ſucceſſive ſounds, when compared with one determinate ſound as a key. Now, a performer, above all others, ſhould be a complete judge of the juſtneſs of theſe relations, in order to reliſh, and enter into the true *ſpirit* of his piece; without which, he ſtands but little chance of executing with proper taſte.

The performers on key'd inſtruments ſeem to have the leaſt occaſion for obſerving the ſmall differences incident to the fourth and ſixth notes, as deſcribed in the two preceding articles: becauſe, although ever ſo well known, they cannot be executed on theſe inſtruments: but then, if the performer have leſs to do with theſe ſmall occaſional variations, the tuner has ſo much the more; for, in truth, theſe inſtruments ought, as near as poſſible, to be ſo tuned, as that every one of the fixt ſounds may be a kind of a *mean* between the two different natural ſounds, which it may occaſionally be put to repreſent.

This method of adjuſting the fixed ſounds of an organ or harpſichord, ſo as to anſwer equally well in all kinds of paſſages, is called *temperament;* of which more particularly in a proper place.

26. We ought not to conclude this chapter, without acquainting the reader, that although the difference between the ſtep of a tone and that of a ſemitone be eaſy to feel; and the different effects of the ſeveral notes of the Gamut, not very hard to perceive; yet to diſcover, in all paſſages, theſe ſmall alterations to which the fourth and ſixth notes are liable, is one of the moſt critical matters in the whole practice of muſic, and what no beginner ought to expect, let his natural talents be ever ſo good, without a great deal of practice. It is by practice only, that our natural faculties of retaining and comparing muſical ſounds are to be improved and perfected; and therefore, ſuch as cannot immediately diſcover the difference of the two ſucceſſive fourths, as deſcribed, Art. 23. ought not, on that account, either to diſpute the reality of the fact, or to doubt of the ſufficiency of their own talents for muſic.

If theſe differences had been very obvious, the overſight of all the writers on muſic, from the earlieſt antiquity, down to the preſent age, would have been inexcuſable; ſince none of them have given us any diſtinct account of theſe occaſional varieties: however, they are far from being imperceptible, when a practitioner partly knows what they are, and where to expect them.

CHAP. II. *Application of the* NATURAL SCALE.

Article 27. WHEN by often practiſing the Gamut, as recommended above, the proper ſound of each note is become familiar to the learner, it will be very eaſy to vary their order; and inſtead of being confined always to aſcend and deſcend by ſingle ſteps, he may occaſionally do it by larger leaps; and thus become able to give the proper ſounds to any muſical * ſucceſſion of notes which may be propoſed.

If it be required, immediately after the key, to ſound the third, or fourth, or fifth, or ſixth above; the directions uſually given to a learner of vocal muſic are; firſt, to run up the ſteps of the ſcale, from the key, to the note required, as quickly as poſſible, and afterwards to join the firſt and laſt notes together; omitting the intermediate ſteps. The ſame directions are given for learning to execute the deſcending leaps, from the key to the ſixth, or fifth, or fourth, or third, or ſecond below.

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* A ſucceſſion of notes, propoſed at random, might chance to be very difficult, even for the moſt expert, to execute; ſo that a learner need not be diſcouraged, on finding it almoſt impoſſible to perform ſome leaps, which are but too frequently found in initial leſſons: he may, on theſe occaſions, reſt aſſured, that ſuch leaps, as are very hard to execute, have but little to do in muſic: becauſe here, in general, whatever is eaſy, is agreeable; and whatever is difficult, is harſh.

Theſe impracticable combinations of ſounds, in muſic, are ſomething like cluſters of conſonants, without a proper intermixture of vowels, in writing; which no body can pronounce, and therefore do not at all belong to ſpeech.

Again, if it be propoſed, immediately after the ſecond, to take the fourth, or fifth, or ſixth; the inſertion of the intermediate ſteps of the ſcale, in as ſhort notes as poſſible, is ſtill directed; until the learner be ſo far advanced in the command of his voice, and ſo habitually acquainted with the peculiar air and effect of each leap, that he has no more occaſion to touch the intermediate ſteps at all.

By this method, a perſon may learn to perform all leaps, from any one note of the ſcale, to any other; and it is often of no ſmall uſe, even to the more expert, in difficult or unuſual paſſages.

28. If the peculiar effect of each note of the ſcale, as mentioned, Art. 21. be carefully attended to, it will greatly aſſiſt the ſinger in the attainment of this neceſſary qualification; and prevent the troubleſome, and oftentimes diſagreeable inſertion of the intermediate notes; which frequently cannot be heard without altering, and perhaps ſpoiling, the genuine air of the tune.

Thus, for inſtance, when the fourth is required to be ſung, the learner, who is acquainted with the peculiar grave tone of the fourth, will be able immediately to give its proper ſound, without regarding how many ſteps of the ſcale are between it, and the former note: thus alſo, the ſupplicative third and ſeventh; and the plaintive ſecond and ſixth, may be kept in readineſs to be inſerted, whenever they are required.

In this way, we are ſuppoſed to keep the key note conſtantly in view, during the whole courſe of a tune; and to conſider all the other notes of the ſcale, chiefly with regard to their ſeveral relations to the key; and that this is the beſt and moſt natural way, I might venture to aſſert from the uncommon progreſs ſome beginners have made, by being taught after this method; but more poſitively from the following conſiderations, which are obvious to all readers who have any taſte for muſic.

29. The common Pſalm tunes of the church are more univerſally known than any other pieces of muſic; and therefore, we ſhall make uſe of theſe for examples, whenever they will ſerve the purpoſe.

Let a perſon ſing, or play over the well known Pſalm tune, called *York* or *Stilt*, as repreſented, Exam. IX. and if he ſings, let him apply the ſyllable *la* to each note, rather than the words of any verſe; the hearer will find, all along, a ſort of expectation of ſomething ſtill to follow, until the performer arrives at the laſt note of the fourth line; at which note, the expectation ceaſes, and the hearer is perfectly ſatisfied with a concluſion on that note: whereas, if the performer were to ſtop at any other place of the tune, ſuch an abrupt ending would be quite unſatiſfactory, and a plain diſappointment to the hearer. *

This natural expectation, which never ceaſes till ſome proper ſucceſſion of notes occur, leading to, and terminating upon one certain ſound, is not peculiar to a few tunes only, but is common to all: we have choſen York tune, as an inſtance, only on account of its eaſineſs: and here let it be obſerved, that if any reader be not already acquainted with this tune; at leaſt, ſo as to ſing or play it by the ear, as it is uſually called, he muſt inevitably learn to do this, before he can properly proceed any further.

Theſe ſucceſſions of notes, which properly lead to the final ſound, are called *regular cadences;* and will be more particularly deſcribed hereafter; and this final ſound, with which we are obliged to conclude, becauſe no other will fully ſatisfy the hearer, is always the key note of the tune; and in all tunes of the ſame ſort * with that we have here uſed, the key of the tune is alſo the key of the natural ſcale, as explained in the former Chapter; and all the other notes are ſeconds, thirds, fourths, etc. to the key.

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* We have, in this Example, directed the ſinger to uſe the unmeaning ſyllable *la*, rather than any connected words; becauſe, the natural expectation, intended to be exemplified, is often kept up by the unfiniſhed ſenſe of the words ſung; when otherwiſe, the muſic might admit of a final cloſe. This expectation has alſo a dependence on the time and meaſure of the muſic, as will be ſhewn when we come to ſpeak of theſe particulars.

Now it muſt be acknowleged, that the hearer, who ſo conſtantly expects the occurrence of this key note at the concluſion, muſt, all along, keep the idea of it in his mind; for if ever he were ſuppoſed to have totally forgot it, what then could hinder him from being as fully ſatisfied with a final cloſe, upon ſome other note?

It is plain then, that in the practice of muſic, the key note is conſtantly kept in mind; and all other notes which are admitted, are ſomeway compared with the key. Theſe compariſons, and the conſequent perceptions, are, indeed, the very eſſence of muſic. It is impoſſible for us to hear two different ſounds, either together, or in ſucceſſion, without attempting to make ſome compariſon, either between one and the other, or between each of them, and ſome third ſound, with which our mind may previouſly be poſſeſſed, and which we regard as a key note.

30. As we neceſſarily conclude every piece of muſic with the key note, ſo we naturally begin with the ſame: this is the caſe in York tune, and moſt part of the other Pſalm tunes in common uſe. If we ſometimes begin with another note of the ſcale, it muſt be one of thoſe which are more nearly related to the key, *viz.* the third or the fifth †; and the initial paſſages muſt be ſuch, as will ſufficiently point out, to an experienced hearer, the real key of the following piece. This neceſſity of having the key plainly pointed out, at the beginning of every piece, may be accounted for, by obſerving that ſo long as a hearer remains in ſuſpenſe, which note to fix upon for a key, he has no enjoyment of the muſic; and if he were to pitch upon a wrong one, it would be ſtill worſe; for the ſucceſſive ſounds, when compared with a different key from that which the compoſer intended, would either produce jarring and offenſive ſenſations, the very reverſe of muſic; or they would, at beſt, produce ſuch as were altogether foreign to the true air and deſign of the piece.

For an inſtance of this, ſuppoſe a man to come within hearing of the fineſt and moſt connected piece of muſic, at the middle of ſome ſtrain; ſuch a man, not having heard the beginning, and conſequently, not knowing what note to pitch upon for a key, would not know what to make of it; it would, for a little time, ſeem to him an unmeaning, unconnected jargon of ſounds; till ſome paſſage occurred which ſhould point out to him the proper key of the whole; and the more he was practiſed in muſic, he would the ſooner be able to determine what was the initial key, and would be the final, from the ſpecies of the middle paſſages. An unſkilful hearer, in ſuch a caſe, might probably never be able to aſcertain the proper key, till the final cloſe; much like a ſchool-boy, who enters, when the maſter is in the middle of one of Euclid's demonſtrations; and can neither diſcover the connexion, nor the deſign of the reaſoning, for want of knowing what is the principal propoſition intended to be demonſtrated.

31. It is the uninterrupted rememberance of one certain ſound, as a principal key, which connects together all the ſucceſſive

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* There is another ſort of tunes which conclude upon the ſixth, or ſecond of the natural ſcale; or rather, which aſſume a different ſeries made up, by piece-meals, out of two natural ſcales, ſo ſituated, that the fifth of one ſcale, is the key of the other; and therefore, the ſixth of one ſcale, is the ſame ſound as the ſecond of the other; and this ſound, partly ſixth, and partly ſecond, is to ſuch tunes a final, or key note; preferable to the real key of either of the two natural ſcales, when thus intermixed.

† This nearer affinity between ſome certain notes of the ſcale, will be particularly explained, under the head of harmonical conſonances.

parts of one piece of muſic. When a perſon has fixed his attention on one ſound as a key note, if other ſounds accidentally intrude upon his ears, which belong to a different key, they have often a moſt diſagreeable effect; although theſe other ſounds, when compared with their proper key be ever ſo agreeable; yet, in compariſon with his key, they muſt be in ſome degree extraneous, and they may be quite incompatible [*]: and before he can hear ſuch incompatible ſounds, with ſatisfaction, he muſt quit his own former key, and turn his attention altogether on that to which they properly belong: this is what we uſually expreſs by a man's being *put out of his tune.*

He that will reſolutely go on with his own tune, when ſuch ſounds interfere, finds himſelf under a neceſſity of confining his attention cloſely to his own notes; and, as it were, ſhutting his ears to theſe incompatible ſounds. The *Dutch concert* [†] is a moſt admirable leſſon for this purpoſe.

The faculty of retaining the impreſſions of muſical ſounds, for ſome conſiderable time after they ceaſe to be heard, is purely natural, and requires no improved abilities at all. The plough-driver who quits his tune abruptly, whenever occaſion requires; and reſumes it again, juſt where he broke off, even after an interruption of ſeveral minutes, is a notable inſtance of this. It ſeems as natural to remember the tone of ſounds which we have lately heard, as the ſhape or colour of objects which we have lately ſeen: but to turn our attention readily from one key note, and the ſounds dependent upon it, to another different key, which introduces with it a different ſett of ſounds, is an attainment due to practice alone, and a kind of force upon nature.

32. From theſe, and numberleſs other inſtances, which will daily occur to the diligent obſerver, it will plainly appear, that a conſtant rememberance of the key note is both neceſſary for the purpoſes of muſic, and natural to the human mind; from hence we infer, that whoever practices muſic, with a view to improve his judgment, concerning the propriety and juſtneſs of each ſucceſſive ſound, ought principally to regard the relation of every one of them to the key; he ought never to uſe a ſound without conſidering it as ſuch a degree of the natural ſcale; and for this purpoſe, if he apply ſeven different ſinging ſyllables, to the ſeven degrees of the Gamut, ſuch as thoſe of the Italians, deſcribed, Art. 13; he ought to regard his ſyllables as a kind of *technical terms*, which, in plain Engliſh, mean no more than the key, the ſecond, the third, etc. of the natural ſcale, reſpectively; and herein conſiſts the advantage of theſe ſyllables, that he who conſiders them in this manner, adopts into his language a ſett of ſhort, fluent monoſyllables, which can eaſily be applied to the ſounds of a tune; and which, to him, ſufficiently expreſs the ſeveral degrees of the natural ſcale, and conſequently the proper effect of every note he uſes.

It is very certain, that by conſtantly uſing ſuch ſyllables, and conſidering them in the manner above directed, a ſinger will, in time, aſſociate the idea of each ſound in the ſcale, with its proper ſyllable, ſo that he will habitually give *fa* the ſound of a fourth, *ſol* that of a fifth, *la* that of a ſixth, etc.; and will plainly perceive an error, when any ſyllable is not applied to its own ſound: but we muſt own that it requires a long time, and a careful application, to arrive at this degree of proficiency; and after we have got thus far, we may ſtill be at a loſs, when we would apply the words of a verſe to a tune, at firſt ſight: ſuch a proficient may be able to *ſol-fa,* as it is called, but yet not able to *ſing*, at ſight.

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[*] We call every different key, *in ſome degree extraneous*, or foreign; but yet ſome are much more ſo than others. There is ſuch an affinity between the key and its fifth or fourth, that we can for a little while turn our attention upon either of theſe as an *occaſional new key*, without entirely relinquiſhing our principal key; but all other *natural* ſcales, except theſe dependent upon the fifth or fourth, are incompatible with the principal ſcale. But of this, more hereafter.

[†] So called, in burleſque; when a company of muſicians fall to, all at once, each ſinging or playing a different tune on a different key, and in a different mood of time, as his own choice happens to lead him; and he that can hold out his tune longeſt, is eſteemed the beſt performer.

It is a droll enough taſk, eſpecially for a ſinger, to keep his own tune, and at the ſame time to be upon the watch, ſo as to be able to point out any other of the company, when he goes wrong.

33. Conſidering that we have occaſion, in ſinging, to apply all ſorts of ſyllables to every ſound; and in inſtrumental muſic, we have nothing to do with articulate ſyllables at all; it ſeems not worth the while to be at ſo much pains to aſſociate every ſound with a particular ſyllable; and if it be an unneceſſary trouble to learn *ſol-fa-ing* in the Italian method, the Britiſh method, deſcribed, Art. 14. is ſtill more difficult, and leſs to the purpoſe; for which reaſon, our moſt diſcerning authors have, long ago, juſtly repreſented *ſol-fa-ing*, as a very laborious and uſeleſs attainment.

Theſe are ſome of the reaſons for which we would adviſe every learner of muſic, whether vocal or inſtrumental, not to beſtow much time in aſſociating unmeaning ſyllables with ſounds, which are already ſufficiently diſtinguiſhable by their effects, as ſhewn, Art. 21.; and whoſe ſituations in the natural ſcale are better and more familiarly expreſſed, as we have hitherto done, by the ordinal numbers: let him rather turn his attention on the very ſounds themſelves; and if he have formerly made himſelf perfect in the Gamut, as recommended in the laſt chapter; let his next ſtudy be, whenever he either performs, or hears a piece of muſic; firſt, to aſcertain its proper key, which he may always do by attending to the characteriſtics of the key already given, Art. 29. and then to determine what degree of the natural ſcale correſponds with each ſucceſſive ſound.

Thus, by obſerving that the firſt ſound of York tune is the ſame as the laſt, the learner may conclude it to be the key note of the ſcale; which being determined, he may, if neceſſary, run over all the ſteps of the Gamut pretty quickly, both upward and downward, for the better fixing in his mind the idea of each ſound, before he proceed to the tune. This done, he will eaſily perceive that the ſecond note of the tune is the ſame ſound as the third of the Gamut; and that the third note of the tune is the fifth note of the Gamut: ſo that the three firſt notes of York tune are, the key, the third, and the fifth of the ſcale.

Proceeding in the ſame manner through the whole tune, he will find each note correſponding with that degree of the Gamut, which is ſpecified by the K, or the figure ſubjoined, in Exam. IX.: And if he ſhould happen to be in any doubt concerning the real degree of any note, he may eaſily have recourſe to the key, which, at any event, he will remember; and by running either upward or downward from the key, till he comes to the ſame ſound, he will infallibly diſcover what it is.

34. In this manner, we ſhall ſuppoſe the learner to examine every plain eaſy tune, with which he is acquainted, if it be of the ſame ſort with this; but it muſt be obſerved, that there is another ſort of tunes, which, as hinted in the note to Art. 29. have a different ſcale, and are called tunes of a mixed or flat ſeries; in contra-diſtinction to the ſort we now propoſe to be examined, which are called tunes of a natural or ſharp ſeries.

The full explanation of the mixed ſeries muſt be delayed till the affinity between the key and its fifth or fourth, mentioned in the note to Art. 31. be more fully handled; only it becomes neceſſary here to give ſome directions, whereby the learner may know whether any tune, with which he is acquainted, be of the one or the other ſort; ſo that he may not be baffled in attempting to apply the natural ſcale to the wrong ſort of tunes.

The moſt palpable difference between theſe two ſorts of tunes is in the third note; which, as we have already ſeen, is a kind of ſupplicative ſound, and only a ſemitone below the fourth in the natural ſcale; whereas, the third of the flat ſcale is a remarkably grave ſound, much like the fourth of the natural ſcale, and is only a ſemitone above the ſecond.

The third of the natural ſcale is called a *major* or greater third, and is two tones above the key; and the third of the flat ſcale is called a *minor* or leſs third, being only one tone and a ſemitone above the key.

Theſe two ſorts of thirds are alſo ſometimes diſtinguiſhed by the epithets *ſharp* and *flat*, rather improperly; as will appear when we come to ſhew what are the received meanings of theſe epithets among muſicians: however, our buſineſs is not ſo much to aſcertain the propriety of words, as of ſounds.

35. The direction given, Art. 29. for aſcertaining the key note, is equally good in both ſorts of tunes. Now, we ſhall ſuppoſe that the learner, after he has found the proper key of any tune, proceeds to try whether it be natural for him to take the greater, or the leſs third above the key, while the rememberance of that tune laſts; and in this trial he cannot be deceived; becauſe it is very difficult to turn our attention from one ſort of a ſcale to the other, while we retain the ſame key note; therefore, if he find it natural to take the leſs third above the key, immediately after he has either played, or ſung, or heard any particular tune, or even when he has been only *thinking of it*, he may ſafely conclude that it belongs to the flat ſeries; and therefore may, for the preſent, defer all further examination of ſuch a tune.

For one inſtance of the change of attention neceſſary to be made between the ſharp and flat ſeries, we ſhall ſuppoſe the reader to be acquainted with the old Pſalm tune, called *Martyrs*, repreſented Exam. X. which is of the flat ſort. Let him firſt ſing, or play this tune over, and then immediately try to begin York tune in the ſame ſound with which he finiſhed this other; he will find that inſtead of the leſs third, which is the ſecond note of Martyrs tune, he muſt now apply a quite different ſound, *viz.* a greater third, in order to come into the true air of York tune; and that before he can properly ſound ſuch a greater third, the rememberance of the leſs third, and indeed of every other note, which he had formerly applied in Martyrs tune, muſt be entirely diſregarded, and quite new ideas ſubſtituted in their ſtead. The truth is, theſe two different ſcales are derived from quite different ways of conceiving the key note. The key of the flat ſeries is conſidered as a plaintive ſound, much like the ſixth of the natural ſcale; and can never, to our imagination, aſſume the boldneſs neceſſary to the key of a ſharp ſeries, Art. 21. until every idea of its effect, as key of a flat ſeries, be entirely ſet aſide.

To make this change of attention ſtill more perceivable, let the learner, after he has begun either of theſe tunes, and ſounded only two or three of the firſt notes, ſtop ſhort there, and attempt to begin again on the ſame key as before, but with the other tune: this experiment he may repeat ſeveral times, beginning the one and the other alternately; and thus by comparing the beginning of *York* tune, with the beginning of *Martyrs*, he may, in a few minutes, acquire a more diſtinct idea of the difference between a greater and a leſs third, than can be conveyed to him by all the words in the world, without ſome ſuch trial.

It is needleſs to dwell any longer on the difference between theſe two ſorts of ſcales; as almoſt every one who has a turn for muſic, will perceive it at the firſt glance of thought: and ſuch as cannot partly find it out, by comparing the beginnings of *York* and *Martyrs* together, as directed above, need not expect to receive much intelligence from any thing we can ſay on the *ſcience* of muſic; at leaſt, not till they have made further progreſs in the *art*, by the aſſiſtance and inſtructions of a maſter.

36. It is impoſſible here to point out any particular tunes which will be the moſt proper for every reader to examine; becauſe, thoſe only are the moſt proper for this purpoſe, which

the reader can already ſing or play by the ear; and of this ſort every different reader will have a different collection. Among the common Pſalm tunes, the Old C. Pſalm, French, London New, St. David's, St. Ann's, Stroudwater, St. Matthew's, etc. are all tunes of the natural, or ſharp ſeries; and therefore may be examined at this time: and Dundee or Windſor, St. Mary's, Walſal, Bangor, Crowle, Norwich, St. Neot's, St. Ive's, Zion, etc. are all tunes of the mixed, or flat ſeries; and, therefore, muſt be omitted at preſent.

The compaſs of ſome tunes lies wholly or chiefly above the final key; ſuch as, French, London New, and St. David's: others are for the moſt part below the final key; ſuch as, St. Ann's: and others extend both above and below the key; ſuch as, the Old C. Greenock, St. Paul's, Stroudwater, and St. Matthew's. This laſt mentioned ſort of tunes have been ſometimes called *plagal*, to diſtinguiſh them from the other, which are denominated *authentic;* but this diſtinction ſeems to be of very little uſe, in the preſent ſtate of muſic.

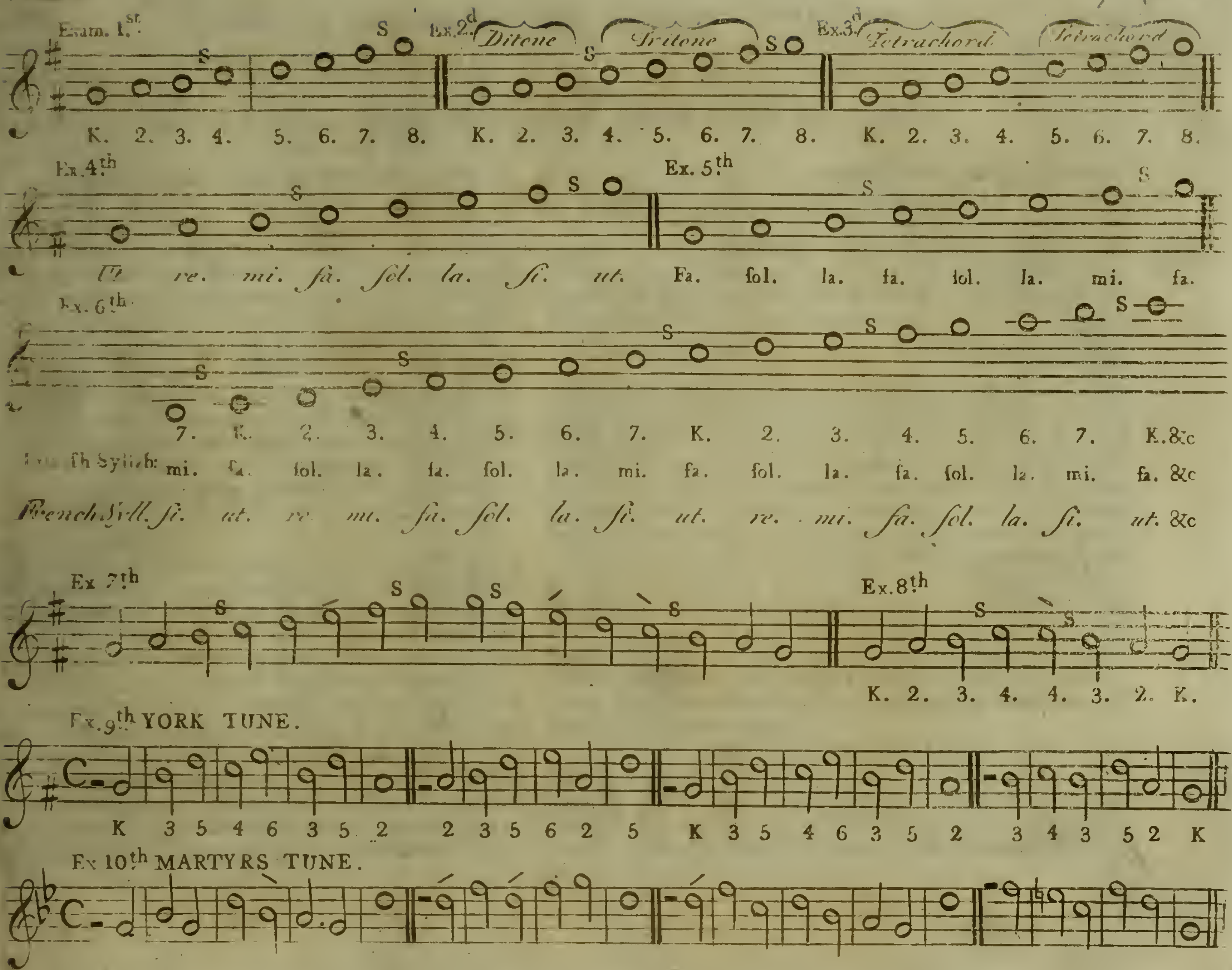
37. In impoſing upon the learner this taſk of conſidering and examining the tunes with which he is acquainted, we are departing from the common courſe of introductory treatiſes on this ſubject. The learner is generally left to the quiet enjoyment of every ſtrain which he can already perform, and is hurried on to a parcel of initial leſſons, which he neither knows how to perform, nor can the dumb leaves of a book lend him the leaſt aſſiſtance. It is plain, that a book can neither ſing, nor ſpeak; it can only refer the reader to certain words which he has formerly aſſociated with their repreſentative letters; or to certain ſounds, which he has aſſociated with their proper characters and names. Therefore we preſume, that as a perſon muſt be able to pronounce a great many words before he begins to learn the alphabet; ſo he ſhould be acquainted with ſeveral tunes, before he begins to ſtudy the application of the ſcale, which is the alphabet of muſic; and as we ſhould firſt learn to ſpell and read our *mother-tongue;* ſo we ſhould firſt learn to apply the ſcale, if I may uſe the expreſſion, to our *nurſes tunes.*

The courſe we propoſe to the learner is briefly this; firſt, to determine the proper key of any tune, with which he is acquainted, by the directions given Art. 29.; then to try whether it be of the ſharp or flat ſeries, by the rule, Art. 35.: if it happens to be of the flat ſort, he may defer all further examination for the preſent; but if it be of the ſharp ſeries, let him proceed according to the method preſcribed, Art. 33. to aſcertain the degree of each ſucceſſive ſound, through the whole tune: and if theſe enquiries ſhould prove a little abſtruſe and difficult at firſt, he may aſſure himſelf that every ſucceſſive trial will render them more and more eaſy; until the proper degrees of every ſucceſſion of ſounds which he hears, become even as obvious to his imagination, as the letters which ſpell any word.

This is the perfection he ought to aſpire at, and theſe are the readieſt and moſt effectual ſteps, we can propoſe to be taken for the attainment of it.

This will ſerve to give an idea of what we call the practical application of the ſcale; in which, the learner's progreſs muſt depend altogether on his own diligence in examining, and natural ability in judging of muſical ſounds. — We come next to ſhew how theſe degrees are repreſented by the lines and ſpaces of our written muſic, which will afford ſufficient matter for another chapter.

Plate 1st


Exam. 1st
S
S
K. 2. 3. 4. 5. 6. 7. 8.
Ex. 2d
Ditone
Tritone
S
S
K. 2. 3. 4. 5. 6. 7. 8.
Ex. 3d
Tetrachord
Tetrachord
K. 2. 3. 4. 5. 6. 7. 8.
Ex. 4th
S
S
Ut. re. mi. fa. sol. la. si. ut.
Ex. 5th
S
S
Fa. sol. la. fa. sol. la. mi. fa.
Ex. 6th
S
S
S
S
S
7. K. 2. 3. 4. 5. 6. 7. K. 2. 3. 4. 5. 6. 7. K. &c
English Syllab: mi. fa. sol. la. fa. sol. la. mi. fa. sol. la. fa. sol. la. mi. fa. &c
French Syll. si. ut. re. mi. fa. sol. la. si. ut. re. mi. fa. sol. la. si. ut. &c
Ex 7th
S
S
S
S
Ex. 8th
S
S
K. 2. 3. 4. 4. 3. 2. K.
Ex. 9th YORK TUNE.
K 3 5 4 6 3 5 2 2 3 5 6 2 5 K 3 5 4 6 3 5 2 3 4 3 5 2 K
Ex 10th MARTYRS TUNE.

CHAP. III. *Of the* MODERN SYSTEM *of* MUSIC.

Article 38. THE natural ſcale, of which we have hitherto treated, has always been, and will always be the ſame in all ages and countries: it ſeems to have been one of thoſe laws which the great Author of nature preſcribed to *himſelf*, in the formation of the human mind, that ſuch certain degrees of ſound ſhould conſtitute muſic: but the names by which theſe degrees have been diſtinguiſhed, and the ways of repreſenting them in writing, being things quite arbitrary, have undergone many alterations; inſomuch, that a whole volume would ſcarce ſuffice to give an account of all the different ſyſtems, which are to be found among the authors of different ages.

Happily for us, of the preſent age, we have one eſtabliſhed ſyſtem, which is received by all the muſicians in Europe; and therefore, we may ſafely confine ourſelves to the explanation of this modern ſyſtem, leaving all thoſe of the antients, as matters of more curioſity than uſe.

39. We ſuppoſe all thoſe intervals in the natural ſcale, which we have hitherto called tones, capable to be ſubdivided into two ſemitones each, by inſerting an intermediate ſound between them: and thus, inſtead of five tones, and two ſemitones, which, as formerly ſeen, are the natural intervals between any one ſound and its octave, we have always twelve ſemitones.

By this means we conceive a ſyſtem of ſounds, indefinitely proceeding both upward and downward, by ſteps which we call ſemitones each; and we ſuppoſe, that if any one of the ſounds of this ſyſtem be conſtituted the key of a natural ſcale, we ſhall always find, among the other ſounds of the ſyſtem, all the other degrees of the ſcale, ſufficiently near for practice; by omitting one ſound, and taking the next, when a ſtep of a tone is naturally required; and by taking the two contiguous ſounds for the natural ſemitone, when it occurs.

40. Thus we have a ſemitonic ſyſtem of ſounds, which we ſuppoſe fixed and immutable; yet ſo regulated, as that any one of theſe fixed ſounds may be the key of a natural ſcale. For denoting theſe fixed ſounds, we make uſe of the ſeven firſt letters of the alphabet, in this manner, *viz.*

Γ * A * B C * D * E F * G * a * b c * d * e f * g * _a_ * _bc_ * _d_ * _ef_ * _g_.

The loweſt ſound is repreſented by the Greek Γ on the left hand; the next ſound, which is a ſemitone above Γ, is repreſented by an aſteriſm *, the next ſemitone is A, the next is an aſteriſm, the next is B, and the next C; ſo that the letters B and C are placed contiguous to each other. In the ſame manner, the letters E and F are contiguous; and all the other have an intermediate ſound between them, repreſented by the *.

Thus, the ſeven letters, with five aſteriſms interſperſed, repreſent twelve degrees, or an octave, of this ſemitonic ſyſtem, Art. 39.: ſo that, when we come to a repetition of the ſame letter over again, we come alſo to the ſame ſound, an octave higher, Art. 15. and 16.; and for diſtinguiſhing theſe ſounds in different octaves, we have put the loweſt octave in capitals; the middle octave in Roman ſmall; and the uppermoſt in Italic ſmall, in the above ſcheme.

41. Theſe three octaves comprehend the whole compaſs ordinarily aſſigned to the human voice. For inſtance, Γ repreſents the graveſt ſound, which a man of a tolerable voice can clearly form; and *g* is the acuteſt ſound, which a woman's voice is ordinarily ſuppoſed to reach: and, although the ſcale

for ſome inſtruments extends much farther, both upward and downward, yet theſe three, which we may call vocal octaves, are all for which we aſſign lines and ſpaces in our written muſic: whatever exceeds this compaſs, is put upon leger lines, Art. 17.

42. According to the above diſpoſition, it will eaſily be obſerved, that if C be conſtituted the key of a natural ſcale, all the degrees of the ſcale will coincide with the letters C. D. E F. G. a. b c. etc. becauſe, in this caſe, the ſemitones, which are naturally the next above the third, and the next below the key, Art. 18. are from E to F, and from b to c; which agrees exactly with the diſpoſition of the letters in our ſyſtem; ſo that, in the key of C, we have no buſineſs with any of the ſounds marked with the *.

43. The caſe is different if we make any other ſound a key; for inſtance, G. The rule requires, that the ſemitones in the key of G, be above b, and below G; now, above b, we have c, which is properly a ſemitone; but below G, we have F, a whole tone: therefore, inſtead of this F, we muſt uſe the note at the *, next below G, which is a ſemitone higher than F, and which we therefore call F ſharp; and ſuch elevation of a note, a ſemitone above its proper ſound, is ſhewn by affixing this character ※, called a ſharp, to its denominative letter.

44. If F be conſtituted a key, the ſemitone from E to F, below the key, is right ſituated; but above a, the third, we have b, a whole tone, inſtead of a ſemitone; ſo that, in the place of this b, we muſt take the note at the *, next below b, which being a ſemitone lower than b, is called b flat; and this depreſſion of a note, a ſemitone below its proper ſound, is denoted by affixing this character ♭, called a flat, to its denominative letter.

45. The proper ſound of any letter is called natural, to diſtinguiſh it from that of the ſame letter, when elevated a ſemitone by an occaſional ſharp, or depreſſed the ſame quantity by a flat; both which altered ſounds are denominated fictitious: according to this diſtinction, all the notes of the ſyſtem marked with the * are fictitious; although they may ſometimes be called the ſharp of the letter below; and at other times, the flat of the letter above: thus the * between G and a. is ſometimes called G ſharp, and at other times, a, flat; and ſo of the reſt.

46. To determine what name properly belongs to every fictitious note, which, in any particular ſcale, we find a neceſſity of uſing, it may be obſerved, that for every fictitious note, which we take in, we muſt of courſe leave out a natural note, either immediately above or below; and therefore, we allot to ſuch fictitious note, the name of the natural note, whoſe place it ſupplies, with the proper addition of ſharp or flat, according to its ſituation above or below the natural.

By this means the ſeven letters, which denominate the natural notes of the ſyſtem, come to be all of them uſed, in every particular ſcale, though differently affected with occaſional ſharps or flats. — The following general ſcheme will ſufficiently illuſtrate this.

47. For the better underſtanding of this ſcheme, we may obſerve, Firſt, That there can be no more than twelve different ſcales, anſwering to the twelve ſemitones in an octave, any one of which may be conſtituted a key. Secondly, That in the order theſe different ſcales are here ranged, every ſubſequent ſcale has either one ſharp more, or one flat fewer, than that immediately preceding. Thirdly, That the fourth of every preceding ſcale, by adding a ſharp to it, or by taking away a flat from it, always becomes a ſeventh in the ſubſequent ſcale. Fourthly, That for rendering the compariſon between each of theſe ſcales and the general ſyſtem more obvious, we have carefully placed each note with its proper name, exactly under the correſpondent note in the general ſyſtem. Fifthly, That we have begun each of the particular ſcales with its key note, and terminated with the oc-

tave of the key, in order that the analogy between each of theſe progreſſions and the natural ſcale, formerly deſcribed, may be more diſtinctly ſeen. Nevertheleſs, each of them may be continued at pleaſure, either upward or downward, by a repetition of the ſame letters, in the ſame order. Sixthly, That when the number of ſharps amounts to ſeven, all the natural notes are a ſemitone elevated, being each of them affected by a ſharp; and in this caſe, the ſcale of C ſharp, N° 8. is converted into that of D flat, in the ſubſequent line; being the very ſame ſounds, but differently named, *viz.* having five flats and two natural notes; and thus, when we are come to ſix ſharps as in N° 7. we take five flats for the next ſcale, rather than ſeven ſharps; and ſo proceed to diminiſh the number of flats for each ſubſequent ſcale, until none of them remain, and we arrive again at the ſame natural ſcale of C, with which we began.

48. SCHEME *of the Formation of the Twelve particular* SCALES *from the* GENERAL SYSTEM.

	General Syſtem.	Γ	*	A	*	B	C	*	D	*	E	F	*	G	*	a	*	b	c	*	d	*	e	f	*	g * *a*, etc.
N°1.	Sharp Series of C	.	.	.	.	.	C	.	D	.	E	F	.	G	.	a	.	b	c	.	.	.	.	.	.	all natural.
2.	of G	Γ	.	A	.	B	C	.	D	.	E	.	F♯	G	.	.	.	.	.	.	.	.	.	.	.	F ſharp.
3.	of D	.	.	.	.	.	.	.	D	.	E	.	F♯	G	.	a	.	b	.	c♯	d	.	.	.	.	F and C ſharp.
4.	of A	.	.	A	.	B	.	C♯	D	.	E	.	F♯	·	G♯	a	.	.	.	.	.	.	.	.	.	F C and G ſharp.
5.	of E	.	.	.	.	.	.	.	.	.	E	.	F♯	.	G♯	a	.	b	.	c♯	.	d♯	e	.	.	F C G and D ſharp.
6.	of B	.	.	.	.	B	.	C♯	.	D♯	E	.	F♯	.	G♯	.	a♯	b	.	.	.	.	.	.	.	F C G D and A ſharp.
7.	of F♯	.	.	.	.	.	.	.	.	.	.	.	F♯	.	G♯	.	a♯	b	.	c♯	.	d♯	.	e♯	f♯	FCGDA and E ſharp.
8.	of C♯	.	.	.	.	.	.	C♯	.	D♯	.	E♯	F♯	.	G♯	.	a♯	.	b♯	c♯	.	.	.	.	.	all ſharp.
	or of D♭	.	.	.	.	.	.	D♭	.	E♭	.	F	G♭	.	a♭	.	b♭	.	c	d♭	.	.	.	.	.	B E A D and G flat.
9.	of A♭	.	A♭	.	B♭	.	C	D♭	.	E♭	.	F	.	G	a♭	.	.	.	.	.	.	.	.	.	.	B E A and D flat.
10.	of E♭	.	.	.	.	.	.	.	.	E♭	.	F	.	G	a♭	.	b♭	.	c	.	d	e♭	.	.	.	B E and A flat.
11.	of B♭	.	.	.	B♭	.	C	.	D	E♭	.	F	.	G	.	a	b♭	.	.	.	.	.	.	.	.	B and E flat.
12.	of F	.	.	.	.	.	.	.	.	.	.	F	.	G	.	a	b♭	.	c	.	d	.	e	f	.	B flat.
The ſame as at firſt,	C	.	.	.	.	.	C	.	D	.	E	F	.	G	.	a	.	b	c	.	.	.	.	.	.	all natural.

49. It will eaſily appear, that, as in beginning from the top of this ſcheme, every ſubſequent ſcale differs from the preceding only in one note; which, being always a fourth in the preceding ſcale, is elevated a ſemitone, and becomes a ſeventh in that which follows; ſo if we begin at the bottom, and proceed upward, we ſhall find every ſcale differing from the next below; in that the ſeventh of the lower ſcale, by being depreſſed a ſemitone, becomes a fourth in the upper: and thus it muſt always be, that the ſharpened fourth becomes a ſeventh, and the flattened ſeventh becomes a fourth, of a new ſcale.

50. The fourth and ſeventh are the only notes liable to be diſplaced, in paſſing from one key to another: this remark belongs more properly to another place; only it ſeemed not amiſs to take notice of it here, that the reader may be the better reconciled with the ſeeming irregularity in the arrangement of the ſeveral ſcales above. The truth is, the fourth and ſeventh are the two terms of the tritone, Art. 11.; and by elevating the lower or depreſſing the upper term of the tritone, we make it a ditone and a ſemitone; and at the ſame time, what was before a ditone and ſemitone, becomes a tritone; ſo that the proper degrees of the natural ſcale ſtill exiſt, but the key note is changed: whereas, if we were to ſharpen any other note except the fourth, or flatten any other except the ſeventh, ſuch a diſlocation would ſpoil the order of the ſounds, and render them not conſiſtent with any natural ſcale.

Take any of the ſcales, in Art. 48. at pleaſure; ſuppoſe that of C, which is there the firſt and laſt, *viz.*

. C . D . E F . G . a . b c .

it will plainly appear that if any one of theſe ſounds, *viz.* C, or D, or F, or G, or a, were flattened, and all the reſt continued as they are, there would be an undivided interval of three ſemitones, called a *trihemitone*, between the flat note and the next above; but there is no ſuch undivided interval in the natural ſcale. In the ſame manner, if any one of theſe, *viz.* D, or E, or G, or a, or b, were made ſharp, and all the reſt remaining unaltered; the ſame undivided and unnatural interval of three ſemitones would be produced, between the ſharp note and the next below; ſo that it is evident no one note can be flattened, except E or b, nor can any one be ſharpened, except C or F, without producing a *trihemitone.*

Now, if C were made ſharp, or E made flat, we ſhould have four ſucceſſive tones together, *viz.* from F to C※, or from E♭ to b, which is inconſiſtent with the ſteps of the natural ſcale; therefore, none but F can be ſharpened, and this produces the ſcale of G, as in N° 2.; and none but b, can be flattened, and this produces the ſcale of F, as in N° 12. In the ſame manner it will appear, that the ſharpened fourth of every ſcale, Art. 48. produces the ſcale next below, and the flattened ſeventh produces that next above; and that theſe are the only *ſingle* alterations which can be made, without ſpoiling the natural order of the ſounds.

51. There is yet ſomething to be obſerved in regard to the ſeventh ſcale in Art. 48. which has ſix ſharps, *viz.* F, C, G, D, A, and E; and of which F※ is the key. In this poſition, e※ takes the place of f natural; and this cannot be avoided, without tranſgreſſing the rule given, Art. 46. *viz.* that all the ſeven letters muſt be uſed in naming the ſounds of each particular ſcale; and this rule is of the utmoſt importance, becauſe, as we ſhall ſhortly ſee, each letter has its proper line or ſpace allotted in our written muſic; at the beginning of which, we prefix the proper mark, to ſhew if ſuch letter be affected with either ſharp or flat, in the particular ſcale we are then making uſe of: ſo that if one letter were to occur twice over, differently affected, and the next letter were quite left out, we ſhould have one double-meaning line or ſpace, which muſt occaſionally denote two different ſounds, and an adjacent ſpace or line, without any meaning at all, as having no ſound appropriated to it.

Thus if we were to uſe f, inſtead of e♯, in the ſeventh ſcale, Art. 48. we ſhould have the letter f, twice over, *viz.* firſt natural, and then ſharp, and the letter e, would be quite excluded; and thus the line or ſpace allotted to e, would have no meaning, while that of f, would have more than could conveniently be expreſſed.

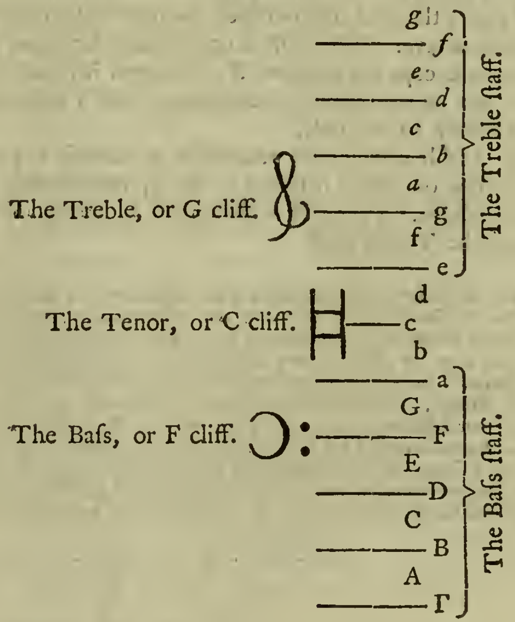
For the ſame reaſons we alſo take B♯ in the place of C natural, in the eighth ſcale, Art. 48. when all the ſeven letters are ſharp; but this ſcale, as already ſhewn, Art. 47. is better expreſſed with five flats, in the ſubſequent line.

52. We now proceed to ſhew how theſe ſeveral ſcales are expreſſed by the lines and ſpaces of our written muſic; and here as obſerved, Art. 41. we have only three octaves, called vocal octaves, to provide for; we therefore take eleven lines, which, with their intermediate ſpaces, are ſufficient for this purpoſe.

Upon theſe lines and ſpaces we ſuppoſe the letters to be ranged in order, as ſhewn below; where obſerve, that the whole compaſs of three octaves, being much more than any ſingle voice can perform; we therefore aſſign the five loweſt lines, with their ſpaces, to the graveſt of men's voices, which we call Baſs; and theſe five loweſt lines are called the Baſs ſtaff: and the five uppermoſt lines we appropriate to women's voices, which we call Treble; and theſe we call the Treble ſtaff. Thus the loweſt octave, denoted by capital letters, belongs properly to the Baſs; and the higheſt octave, denoted by Italic ſmall letters, belongs to the Treble.

Between the Baſs and the Treble ſtaff, there is one intermediate line, which expreſſes the c of the middle octave, *viz.* of that octave which we denote by Roman ſmall letters, and which may be called the Tenor octave. To this intermediate line, we therefore ſometimes add the two loweſt lines of the Treble ſtaff, and the two uppermoſt of the Baſs ſtaff; and ſometimes more of the Baſs lines, and fewer of the Treble; or more of the Treble, and fewer of the Baſs, ſo as always to make up five lines in whole; which we allot to the middle voices, under the name of Tenor, Medius or Contra.

53. *Scheme of the Diſpoſition of the Letters upon Lines and Spaces.*



54. Now, in order to ſhew what letter belongs to each line and ſpace of our written muſic; and alſo, whether ſuch letter ought to be underſtood as in the Baſs, or Tenor, or Treble octave; we prefix to every ſtaff of lines a certain mark, called a cliff; of which we have three ſorts, as repreſented above, *viz.*

1ſt, The Baſs cliff is a kind of inverted C, with two points after it; and this ſhews that the line on which it is placed, *i. e.* the line between the two points, is F, of the Baſs octave. It is generally ſet upon the fourth line of the Baſs ſtaff, as in the preceding ſcheme.

2*dly*, The Tenor cliff is two upright and two tranſverſe ſtrokes; and ſhews that the line between the tranſverſe ſtrokes is c, of the Tenor octave. This cliff is occaſionally ſet upon any of the five lines, except the uppermoſt: wherever it ſtands, the lines above it may be conceived as belonging to the Treble ſtaff, and the lines below to the Baſs.

3*dly*, The Treble cliff partly reſembles a careleſs G; and ſhews that the line on which it ſtands is the g, immediately below the treble octave. This cliff is always ſet, as above, on the ſecond line of the Treble ſtaff.

55. The name of the cliff line being thus determined, the names of all the other lines and ſpaces follow of courſe, *viz.* by counting upward from the cliff, in the alphabetical order of the letters; obſerving after G, to begin again with A; and by counting downward from the cliff, in the ſame order reverſed *.

The learner ought to practiſe this method of naming the lines and ſpaces by letters, till it become quite familiar to him; eſpecially in the Baſs and Treble ſtaffs; not only, becauſe theſe two are moſt commonly uſed, but alſo, becauſe the Tenor ſtaff, as ſhewn above, is made up by joining ſome part of each of theſe to the intermediate, or Tenor cliff line; ſo that the Tenor ſtaff has nothing properly its own, but the cliff line; whatever is above may be conceived as borrowed from the Treble; and whatever is below, from the Baſs.

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* Though any of the ſeven letters, placed at the beginning of a ſtaff, might have anſwered the purpoſe of a cliff, to determine the places of all the reſt; yet the firſt inventor probably made choice of theſe three letters, C, G, and F, rather than any other; becauſe, as has been already ſhewn, Art. 42. *et ſeq.* theſe are the letters which can be conſtituted keys, with fewer diſlocations of the natural ſounds of the ſyſtem than any other; ſo that they may, properly enough, be called keys, or *cliffs*, by way of eminence, even in our modern ſyſtem.

Among the antients, theſe three letters were ſtill more diſtinguiſhable. *Guido Aretinus*, to whom the invention of lines, marked with cliffs, is generally attributed, had, indeed, no other keys but theſe; neither were the ſcales, even of thoſe, quite entire in his ſyſtem, according to our modern form; for he admitted none of our fictitious notes, except b♭; whereas the modern ſcale of G requires F ſharp, for its ſeventh note, which was not in Guido's ſyſtem.

The truth is, the ancients did not conſider all the ſeven ſounds of the Gamut, as depending immediately on the principal key; but ſome of them, in certain paſſages, were ſuppoſed to depend either upon the fifth or fourth, as an occaſional new key, [See the firſt note to Art. 31.] and the ſeventh note in particular was always referred to one of theſe; ſo that the ſcale of any ſound was ſuppoſed to be, at the moſt, only ſix notes, called a *hexachord;* to which Guido appropriated the ſix ſyllables, *ut*, *re*, *mi*, *fa*, *ſol*, *la*, beginning firſt from Γ, then from C, then from F, then from G, etc. as here repreſented.

Γ	A	B	C	D	E	F	G	a	♭	b	c	d	e,	etc.
ut	*re*	*mi*	*fa*	*ſol*	*la*									
			ut	*re*	*mi*	*fa*	*ſol*	*la*						
						ut	*re*	*mi*	*fa*		*ſol*	*la*		
							ut	*re*		*mi*	*fa*	*ſol*	*la*	
											ut	*re*	*mi*	etc.

We ſhall have occaſion to conſider this ſcheme hereafter; it may ſerve at preſent to ſhew Guido's reaſon for placing ſo particular a regard on thoſe letters. It will alſo ſerve to account for thoſe, ſeemingly, *barbarous* names which the muſicians ſtill uſe, viz. *Gamut*, *A re*, *B mi*, *C fa ut*, *D ſol re*, etc.: as theſe names will appear to be taken exactly from Guido's ſyſtem; by annexing to each letter all the ſyllables by which it may occaſionally be expreſſed, and which, in this ſcheme, fall directly below the letter.

56. Thoſe ſounds which aſcend ſtill higher than the Treble octave, and which are therefore placed upon leger lines above the Treble ſtaff, are denominated by the ſame letters, in the ſame order, with the addition of the words *in alt.*; thus, the ſpace above the five lines being called G, the firſt leger line above is A *in alt.* the ſpace above that line is B *in alt.* the ſecond leger line is C *in alt.* and ſo on.

On the contrary part, the notes below the Baſs octave, which are placed on leger lines below the Baſs ſtaff, are called *double Baſs*, and expreſſed by doubling the denominative letter; thus, Γ being the loweſt line of the Baſs ſtaff, the ſpace below is called double F, and denoted thus F F; the firſt leger line is E E; the ſpace below that is D D; the ſecond leger line is C C; and ſo on.

57. When any letter ought to be either ſharp or flat, in the particular ſcale, to which we propoſe to adapt our tune, we place the reſpective character upon the line or ſpace belonging to ſuch letter, immediately after the cliff; and we look upon the ſharps or flats, which thus ſtand at the beginning, as influencing all the notes, which ſtand on the ſame lines or ſpaces, throughout the whole tune.

For inſtance, if we would write a tune of a ſharp ſeries, for a Treble voice or inſtrument, upon the key of G; we begin with placing the Treble cliff upon the ſecond line; then we conſider that if G, which here is the cliff line, be intended the key of the tune, we muſt ſharpen F, agreeable to the ſecond ſcale, Art. 48.; we therefore place the ſharp character upon the ſpace below the cliff line, which is the place of F; and becauſe the ſame letter F occurs again, on the uppermoſt line, we may alſo place another ſharp there, or we may omit this other ſharp at pleaſure; it being a conſtant rule, that if the ſame letter occur twice in one ſtaff of lines, and one of its places be marked with either ſharp or flat, the other is alſo underſtood to be affected in the ſame manner, whether the mark be there or not.

See Plate I. Exam. I. at the beginning: alſo Exam. VII. In theſe the ſharp is placed upon both the upper and the lower F, immediately after the Treble cliff. See alſo Exam. IV. and IX. in which only the lower F is marked ſharp, the other F is underſtood to be the ſame, though not marked.

The key of the natural ſcale in each of theſe Examples is G, as we have all along ſuppoſed it to be; the reader will now underſtand that ſo it muſt be, whenever F is made ſharp.

In Exam. VI. there is neither ſharp nor flat after the cliff, and therefore, all the letters are natural; from whence we conclude that C is the key of the natural ſcale, Art. 42. and by counting upward from G, the cliff line, we find the third ſpace, *viz.* the ſpace above the middle line belongs to C; therefore, we conclude this to be the place of the key. See Art. 17.

In Exam. X. we have two flats, *viz.* B and E, after the cliff, which correſponds with the eleventh ſcale of Art. 48.; and therefore, B♭ ought to be the key of the natural ſcale; but yet this tune, being one of the mixed or flat ſeries, has its final or key note upon G, which, as will eaſily be ſeen, is the ſixth of the natural ſcale. See Art. 35. and the ſecond note to Art. 29.

58. In the ſame manner, we may always determine the key of a ſharp ſeries, by the ſharps or flats which follow the cliff: and this we may do, by obſerving only the number of them, although they ſhould happen to be a little miſplaced; for whenever we ſee two ſharps, we may conclude that they are, or ought to be, upon F and C, and that D is the key of the ſharp ſeries; agreeable to the third ſcale, Art. 48. Three ſharps muſt be F, C, and G, with A as key of the ſharp ſeries, as in the fourth ſcale; and ſo on.

In like manner we may conclude, when we ſee one flat, that its place is B, having F for a key. Three flats are B, E, and A, with B♭ as a key; and ſo of the reſt: obſerving always that if the ſame letter occur twice in the compaſs of the ſtaff, and both its places be marked ſharp or flat, yet theſe two marks are to be accounted only as one, agreeable to the preceding Article.

On the contrary, if we would write a tune of a ſharp ſeries, and intend to make ſuch a certain note the key; we may always, by inſpecting the Scheme, Art. 48. find out the particular ſcale of our intended key, and the number and poſition of the ſharps or flats, neceſſary to be prefixed.

59. From what is already ſaid, it will plainly appear, that every perſon, who would make any progreſs in the knowlege of our written muſic, muſt be familiarly acquainted with the two preceding Schemes, Art. 48. and 53.; and it would be well if every reader, who finds himſelf not able ſufficiently to retain them in his memory, would be at the pains to copy them fair over with his own hands; for I can ſafely affirm, from experience, that by once actually copying ſuch ſchemes as theſe, he will acquire a more complete idea of them, than by forty times looking tranſitorily over them.

60. There can be no occaſion for any more than once copying over the Scheme, Art. 53. for imprinting it ſufficiently on the memory of a learner; but that in Art. 48. being more complex, the learner may ſtill find a difficulty in retaining it ſo completely in mind, as to be able, without the book, to apply it on any occaſion: therefore the muſicians find advantage in ſubſtituting a kind of *technical memory*, for this purpoſe. Of this ſort are the rules for finding *mi*, which are to be found in different forms, among our authors; the following ſeems to be more comprehenſive and eaſier to retain, than any I have ſeen;

Name thus your ſharps, F, C, G, D, A, E:
Your flats call, B, E, A, D, G, and C:
Of ſharps the laſt; of flats the following letter's *mi*.

The meaning is this; when we have ſharps after the cliff, whether there be more or fewer of them, F is to be accounted the firſt; C, the ſecond; G, the third, and ſo on; according to the order in which they ſucceſſively enter, in deſcending from the top of the Scheme, Art. 48.; and when we have named all our ſharps in this order, the laſt named letter is always the ſeventh of the ſcale, or the *mi* of our Britiſh ſyllables, Art. 14. When we have flats after the cliff, B is to be accounted the firſt; E, the ſecond; A, the third, and ſo on; according to the order in which they ſucceſſively enter, in aſcending from the bottom of the Scheme, Art. 48.; and when we have named all our flats in this order, the following letter, or that which would come next in courſe to be flattened, is the ſeventh of the preſent ſcale, *i. e. mi*. This will plainly appear to be the caſe by inſpecting the Scheme itſelf, with the third obſervation in Art. 47.: becauſe, in adding ſharps, the laſt added ſharp always becomes the preſent ſeventh; and in taking away flats, the letter laſt reſtored to its natural place is the preſent ſeventh: which letter is always the next following, in the above order of flat letters.

Having thus found the place of *mi*, which is the ſeventh of the ſcale; the ſemitone next above *mi*, is to be accounted the key. A few examples will make all this abundantly plain.

For inſtance, one ſingle ſharp is always F♯, and here F♯ being laſt, as well as firſt, is *mi*, and G, which is a ſemitone higher, is the key.

Two ſharps are F♯, and C♯: here C♯ is *mi*, and D, a ſemitone higher is the key.

Three ſharps are F♯, C♯, and G♯; here G♯ is the *mi*, and A is the key: and ſo of the reſt, until we come to the ſix ſharps, of which the laſt is E♯; and this being the ſame note with F natural, we therefore ſtep a ſemitone higher to F♯, which is then the key; as in the ſeventh ſcale, Art. 48.

Again, one ſingle flat is B♭, and here E, which is the next following letter, is *mi*; and F, the ſemitone next above E, is the key. Two flats are B♭ and E♭; here A is *mi*; and B♭, a ſemitone higher, is the key. Three flats are B♭, E♭, and A♭; here D is *mi*, and E♭ is the key; and ſo of the reſt, until we come to five flats, of which the laſt is G♭, and the following letter is C, which is therefore *mi*, and D♭, the ſemitone next higher, is the key; as in the eighth ſcale of Art. 48.

It may be obſerved that C, which is the laſt letter of the order for flats, is never itſelf marked flat at the cliff; neither is B ever marked ſharp. We admit no more than ſix ſharps, or five flats, at the cliff.

61. Having hitherto ſuppoſed the learner to apply his attention to tunes of the ſharp ſeries only, without meddling with thoſe of the flat ſeries; it becomes neceſſary here to obſerve, that after aſcertaining the key of the natural ſcale, of any written muſic, by the preceding rules; if he be not already acquainted with the air of it, he muſt look to the final note; and if he find that it ends upon the key of the natural ſcale, he may ſafely conclude, that it is of the ſharp ſort; but if it ends upon the ſixth or ſecond, he may conclude that it is of the flat ſort. He muſt obſerve alſo, that when ſeveral different ſtaffs are placed below each other, and coupled together by a large bracket, at the beginning, it ſignifies, that while one voice or inſtrument goes on with the notes of one of the ſtaffs, other voices or inſtruments are to accompany with the notes of the other ſtaffs; each in the proper degrees of ſound, as ſhewn by the cliffs prefixed to the ſeveral ſtaffs; ſo that one, two, three, four, or more different tunes are to be carried on together; and the joint effect of theſe compounded tunes, when properly performed, is called *harmony;* in contradiſtinction to the effect of one ſingle tune, which is called *melody*.

In regard to this ſort of compoſitions, we ſhall only obſerve for the preſent, that each tune, in reſpect of the *whole*, is called a *part;* and that whatever number of parts be aſſigned to Treble, or to Tenor voices, or inſtruments, there muſt always be one Baſs part, which is a kind of fundamental to all the reſt; and which is ſuppoſed to attract the hearer's attention, at the ends of ſeveral ſtrains, or portions of the tune; and more parcularly at the final concluſion.

Theſe parts are known by their cliffs, as ſhewn Art. 54. and alſo by their ſituation under each other: the Baſs is always put loweſt, the Trebles higheſt, and the Tenors, if any be, are put in the middle between them: and for aſcertaining the key note of one of theſe compoſitions in ſeveral parts, we muſt always look to the laſt note of the Baſs; becauſe, the hearer's attention being here chiefly upon the Baſs, it is the only part which muſt neceſſarily conclude with the key.

The upper parts are often allowed to end upon the third or fifth of the ſcale; ſee the note to Art. 30.: and yet they muſt all have the ſame key as the Baſs; or otherwiſe they could not be heard together, with any ſatisfaction. This does not contradict what was ſaid, Art. 29.: for if one of theſe upper parts, which ends upon the third or fifth, were performed alone, ſuch an ending would not be fully ſatisfactory; but would ſeem to require ſomething more to follow, contrary to the characteriſtics there given of the key note.

62. After aſcertaining the place of the key note, of any written tune, the places of all the other degrees of the ſcale will be known of courſe; and it is worth a learner's while to obſerve, that if the key note be upon a line, the third, fifth, and ſeventh above will alſo be upon lines; and the ſecond, fourth, ſixth, and octave above, upon ſpaces: on the contrary, if the key note be upon a ſpace, the third, fifth, and ſeventh above will alſo be upon ſpaces; and the ſecond, fourth, ſixth, and octave, upon lines. This remark has been found of conſiderable uſe, eſpecially in learning to ſing, at firſt ſight, by the notes; becauſe the ſinger has nothing elſe to direct his choice of notes, but the knowlege of their ſeveral relations to the key, and their peculiar effects, as deſcribed, Art. 21.; ſo that every remark which tends to make theſe relations more obvious, is a valuable

acquiſition to the ſinger in particular, and indeed to every performer in general; for although ſeveral inſtruments be managed, in a mechanical way, by the fingers, yet the performer's ear and judgment muſt aſſiſt him to reliſh, and enter into the true ſpirit of his piece, as obſerved, Art. 25.

We come next to explain what belongs to the article of Time; this being indiſpenſably neceſſary to be underſtood, before a perſon be qualified to attempt the performance of muſic, by help of the notes only; for it is to no purpoſe that we know how to give each note its proper ſound, unleſs we alſo know how long time each ſound ought to be continued.

CHAP. IV. *Of* TIME, *and the Characters relating thereto.*

Article 63. AS the different degrees of tune or pitch are repreſented by the ſituations of certain characters, upon different lines or ſpaces, with proper cliffs, and other marks prefixed, in the manner already explained; ſo the different proportions of time, or duration of the ſounds of muſic are ſhewn by ſeveral ſorts of characters, which we make uſe of, for that purpoſe; their names, forms, and meanings, are to be ſeen in Plate II. Exam. XI.

64. The ſemibreve, which is a round note, expreſſes the longeſt duration of time, among our modern characters; and may be eſteemed as a kind of meaſure which regulates all the reſt: the minim is the ſame round note, with a ſtem added to it, and denotes half the time of a ſemibreve: the crotchet is a black head with a ſtem; and is half a minim, or a fourth part of a ſemibreve: the quaver has a ſtroke a-croſs the ſtem, or elſe the extremity of the ſtem turned back again in the form of a hook, and is half a crotchet *. The ſemiquaver has two ſtrokes a-croſs the ſtem, or elſe a kind of double hook; and is, as its

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* There is an impropriety in calling the ſtraight-ſtemmed note a *crotchet;* which, though it may be but of little importance to the muſician, is ſtill leſs honor to the linguiſt, who firſt adopted this name into our language. The word ſeems to come directly from the French *crochet*, which ſignifies a hook, or pick-lock; and therefore belongs properly to the note we call a *quaver;* and, which makes the miſ-application ſtill more inexcuſable, the French muſicians have all along called their hooked note by the name of *croche*.

The names ſemibreve and minim are not very proper at preſent, but may be diſpenſed with, if we conſider the firſt riſe of them. For ſome ages, after the invention of lines and cliffs, they uſed nothing but three ſorts of ſquare characters, of different ſizes, which they placed in various manners, to denote the proportions of the time of ſounds; theſe characters were called by the Italians, *maſſima*, *longa*, and *breve;* meaning the largeſt, the long, and the ſhort, reſpectively. Afterwards came the *ſemibreve* into uſe, which was at firſt of a diamond form, but is now made round; then followed the *minima*, or ſhorteſt note; and hence aroſe the two names, ſemibreve and minim, which we ſtill retain.

The ſhorter notes are of later date, and ſeem to have been taken in one after another, as the longer were caſt off: however, it it is more than probable, that in former times, the *maſſima*, or large, was ſung not much longer than our ſemibreve is at preſent, in church muſic; ſo that the alteration is rather in the forms and names of the ſeveral notes, than in the real length of the ſounds of muſic.

We here ſubjoin the French, and Italian names of the notes in Examp. XI.

ENGLISH.	Semibreve,	Minim,	Crotchet,	Quaver,	Semiquaver,	Demi-quaver.
FRENCH.	*Ronde,*	*Blanche,*	*Noire,*	*Croche,*	*Double Croche,*	*Triple Croche.*
ITALIAN.	*Semibreve,*	*Minima,*	*Semiminima,*	*Chroma,* or *Fuſa,*	*Semichroma,*	*Biſ-chroma.*

name imports, the half of a quaver. Demi-ſemiquavers, ſometimes called, by contraction, demi-quavers, are joined by three croſs ſtrokes, and are each the half of a ſemiquaver: theſe are the ſhorteſt notes which ordinarily occur in modern muſic; four of them are equal to one quaver; eight, to one crotchet; ſixteen, to one minim; and thirty-two, to one ſemibreve.

65. After each of theſe notes, in Exam. XI. is placed another character, which is called a Reſt, or Pauſe; and is uſed to denote a ſilence, or ceſſation of ſound, equal in length to the value of the note which there precedes it, and from whence it takes its name: thus, the black ſquare character which projects downward from any line, is called a ſemibreve reſt *; the ſame character projecting upward from any line, is a minim reſt; the crotchet reſt is like a tenter-hook, turned towards the right-hand; the quaver reſt is the ſame, turned towards the left-hand; the ſemiquaver reſt is a double hook; and the demi-ſemiquaver reſt, a triple hook, turned towards the left hand.

66. A dot or point put after any of theſe notes augments its value, and makes it juſt one half longer: thus, a pointed ſemibreve is equal to a ſemibreve and a minim, or three minims: a pointed minim is equal to a minim and a crotchet, or three crotchets: a pointed crotchet is equal to three quavers, and ſo on. See Exam. XII. where the pointed notes are placed above, and the equivalent plain notes below.

67. The figure 3, placed over three equal notes of any kind, ſhews that thoſe three notes are diminiſhed in value, ſo as to be all performed in the ſame time which two of them would otherwiſe require: thus, three crotchets, figured over with a 3, are to be performed in the time of one minim: three quavers, figured over with a three, are equal to one crotchet; and ſo on. See Exam. XIII. where the figured notes are placed above, and the equivalent plain notes below.

It may be obſerved from this, and the two preceding examples, that if we pitch upon any plain note, except the longeſt or the ſhorteſt, we can always expreſs its double, or its half; and its triple, or its third part, by the above methods of notation: for the next longer plain note is always double, and the next ſhorter is half; the double note, with the addition of a point, becomes triple; and the half, by figuring it over with a 3, becomes a third part.

68. To explain the proper method of applying theſe characters, we obſerve, that although the ſucceſſive ſounds of muſic are often vaſtly unequal, in reſpect to their length, or duration; yet ſtill there are certain due proportions of time which muſt be adhered to, with the greateſt care and exactneſs, or otherwiſe the muſic will appear *wild* and incoherent: and in order to diſcuſs this matter fully, we muſt firſt take notice of the natural diviſion of all *regular* muſic into certain equal-timed parcels, called Meaſures.

69. This meaſure is, in regard to the time of muſic, ſomething like the key note, in regard to the tune or pitch of ſounds; for as every degree of ſound muſt bear its proper relation to one eſtabliſhed key note, ſo the length of every ſound muſt bear a due proportion to one eſtabliſhed meaſure, which runs through the whole piece †. This equal-timed meaſure ſometimes comprehends more, and ſometimes fewer different ſounds, according

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* The ſemibreve reſt is alſo uſed to denote the reſt of a bar, even though the bar ſhould contain more or leſs than a ſemibreve, as we ſhall hereafter ſhew: there were alſo other characters formerly in uſe, which denoted the reſt of two, or four, or eight bars, or more; but they are now laid aſide, and a more intelligible method of expreſſing ſuch long ſilences is ſubſtituted in their ſtead.

The Italians name the reſts in the ſame manner we do, viz. *pauſa di ſemibreve, pauſa di minima, pauſa di ſemiminima*, etc.; but the French have more conciſe names which are well worth our notice: they call the ſemibreve reſt, ſimply *une pauſe;* the minim reſt, *demi-pauſe;* the crotchet reſt, *ſoupir*, which is a ſigh; the quaver reſt, *demi-ſoupir;* and the ſemiquaver reſt, *quart de ſoupir*.

† There is a moſt remarkable analogy between the choice of the mind in regard to the time, and its choice in regard to the tune of ſounds, which has never yet been taken notice of; and which we ſhall endeavour to purſue to advantage, when we come to ſpeak of the theory.

as the ſounds are longer or ſhorter; but ſtill the length of all the notes, taken together, ought naturally to be the ſame, in every meaſure throughout a whole tune

70. In written muſic theſe meaſures are ſeparated by ſmall perpendicular lines drawn acroſs the ſtaff, which we call Bars; and although theſe lines be properly ſo called, yet we often uſe the ſame word to expreſs the notes comprehended between two bars, *i. e.* the meaſure of the muſic; ſo that a *meaſure* and a *bar* are often ſynonymous terms.

71. Beſides this neceſſary diſtribution of the ſucceſſive ſounds of muſic into certain equal-timed parcels, called meaſures, or bars; it is alſo requiſite that each meaſure be conceived as divided and ſub-divided into ſmaller equal parts: and on examination of the ſeveral kinds of diviſions and ſub-diviſions, which are admitted in the meaſure of muſic, it is very remarkable, that we never find any other parts, but ſuch as ariſe either from biſection or triſection; that is, ſuch as are either halves, or third parts of the whole meaſure, or of ſome of its parts. Thus the diviſion into four, or eight, or ſixteen parts, ariſes from a continual biſection: the diviſion into five equal parts is not admitted: a ſixth part may be either the half of a third part, or the third part of a half: a ſeventh part is never uſed: a ninth part is the third, of a third part; a tenth part is rejected on account of its implying a diviſion by five, which is not admitted; for the tenth part would either be the half of a fifth, or the fifth part of a half: an eleventh part is impracticable: a twelfth part may be either the half of a ſixth, or the third part of a fourth.

Thus we might proceed to aſcertain the other practicable and impracticable diviſions of the meaſure in muſic, which have their parts ſtill ſmaller and more numerous than thoſe above-mentioned; the ſame rule ſtill takes place, *viz.* that the number of equal parts which we imagine the meaſure to contain, muſt be a number ſome way produced, by repeated multiplication, from one, or both of the ſmall factors, 2 and 3. But we need not to purſue this ſpeculation any further at preſent.

72. If we conceive the entire meaſure to be continually biſected, which is the eaſieſt and moſt natural ſub-diviſion, ſuch a partition conſtitutes the ſpecies of time, called double or common time; which we mark, in written muſic, when ſlow, by a large C after the cliff; when quicker, by the ſame C, with a bar drawn down through it. See Exam. XIV. and XV.

Theſe marks for denoting the ſpecies of the time, are called Moods. In the firſt of the above-mentioned moods, which is a plain C, every bar contains the quantity of a ſemibreve; in the other, which is a barred C, we ſometimes find the quantity of two ſemibreves; and ſometimes only one in every bar *.

73. For acquiring a proper idea of the natural ſub-diviſions of the meaſure in common time, the following obſervations will be found of great uſe to a learner. Upon applying a watch to our ear, and liſtening to its beats or pulſes, we always find them proceeding by pairs, *i.e.* by two and two together; which is owing to the pulſes being alternately a little ſtronger and weaker, even in the very beſt of watches; and they are often much more ſo, in the common ſort. Theſe pulſes we can moſt eaſily count, 1, 2, 1, 2, 1, 2, and ſo on; and in this way of counting, each ſingle pulſe may properly enough repreſent the time of a ſemiquaver. We can alſo, with a very little attention, place our regard on the alternate ſtronger pulſes, and diſregard the weaker ones, ſo as to apply the ſame way of counting, 1; 2; 1; 2; 1; 2; *etc.* in a ſlower manner, to the ſucceſſive pairs of ſingle pulſes;

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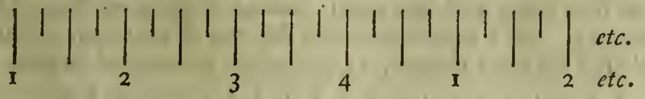
* This latter mood is called by the Italians, *tempo alla breve;* in contra-diſtinction to the former, which is called *tempo alla ſemibreve;* which terms ſeem to intimate that the quantity of two ſemibreves, or a breve, moſt properly belongs to the mood of the barred C: but although, in this mood, the notes ought to be made ſhorter than in the other, yet they are not ſo much ſhortened as to bring the whole breve into the time which a ſemibreve requires, in the other mood; nor indeed is there any fixt rule for the comparative proportions of the time of a bar, in different moods.

conſidering each pair, for the time, as conſtituting one pulſe of a ſlower ſort, anſwering to the time of a quaver. We can proceed yet further, in the ſame manner, to regard two of theſe pairs, *i. e.* four ſingle pulſes as conſtituting one pulſe of a ſtill ſlower ſort, anſwering to the time of a crotchet; and theſe parcels, of two pairs in each, we can alſo count, 1: 2: 1: 2: 1: 2: *etc.* or we can count them, 1: 2: 3: 4: 1: 2: 3: 4: and ſo on; which laſt method repreſents exactly the diviſion of the common time meaſure into four crotchets, and the ſub-diviſion of each crotchet into four ſemiquavers.

This being a moſt uſeful, and, as far as I can learn, a new method*; we here ſubjoin a repreſentation of the ſucceſſive ſingle pulſes, by a row of ſmall perpendicular lines; alternately longer and ſhorter, to denote the ſtronger and weaker, or, as we may call them, the naturally accented, and unaccented pulſes; under which are placed figures to illuſtrate the method of counting, as above recommended, by 4 in a parcel.



The ſpace of time, from 1 to 2, from 2 to 3, *etc.* in this way, is almoſt a ſecond of a common houſe-clock; and the time from 1 to 1 again, is to be eſteemed the entire meaſure, or bar. It matters not though the real length of the meaſure ought to be made ſomething more, in Church muſic; and often much leſs, in Opera muſic: the learner, who by practice in counting the pulſes of a watch, after this manner, has rendered this ſort of ſub-diviſion familiar to his mind, will find no difficulty in applying it to any meaſure, whether longer or ſhorter.

74. The cuſtom of maintaining ſome uniform motion, either with the hand or foot, to denote the proper diviſion of a tune into meaſures, and the ſub-diviſion of each meaſure into certain parts; which is called *beating time*, is very advantageous to a learner; and abſolutely neceſſary for the moſt expert performers, when a number join together, in the parts of a harmonic compoſition: with this difference, that the learner ought to begin with quicker, and more frequent motions; becauſe, it requires practice to judge of the equality, when the motions in beating time are very ſlow; ſo that in ſuch moods as the expert muſician needs only one motion for a whole bar, the beginner ought to uſe two, or, perhaps, four motions in the ſame time.

75. It is beſt to begin to beat ſlow common time with four motions in a bar, thus; let the learner ſit with a table or deſk before him, and applying a watch to his ear with the left hand; let him count its pulſes by 4 and 4 together, as directed Art. 73.: let the right-hand be put down at 1, the fingers raiſed a little, without moving the wriſt from the table, at 2; the hand raiſed towards the left breaſt, at 3; and from thence towards the right ear, at 4; then down again at 1; and ſo on.

This method muſt be followed till he can perform theſe four motions, in equal time, without the help of the watch; which will coſt ſome attention and practice; but it will, in the iſſue, abundantly requite all the pains which may be beſtowed upon it.

76. Thoſe who apply themſelves to the practice of inſtrumental muſic, in which the hands are to be otherwiſe employed, may, inſtead of the four motions of the hand, as above, ſubſtitute correſpondent motions of the foot, ſuch as theſe; *viz.* while the heel continues conſtantly on the ground, let the toe be raiſ-

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* Several authors adviſe the counting of the ſingle beats of a houſe-clock for crotchets; but a watch is vaſtly preferable; becauſe the quick pulſes of a watch, taken by 4 and 4 together, give an idea of the natural ſub-diviſion of the crotchet; and this ſub-diviſion is as eſſential to the common time moods, as the primary diviſion itſelf. The watch is alſo preferable, becauſe a learner will have it ready, in any place.

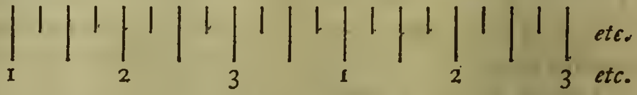
ed a little, and ſo kept in readineſs, to be put down exactly at 1; raiſed again at 2; put down again at 3; and raiſed at 4; and ſo on: and in order to attain the habit of performing theſe alternate motions in equal time, ſuch as have not the opportunity of counting a watch, or a houſe-clock, will find it uſeful to ſtand and move the whole body, inclining a little forward, and back again, as the toe is put down and raiſed; but, if this is done, it muſt be with ſpecial caution, that the motion of the body be no longer uſed, than till the learner can keep equal time without it; which he will eaſily experience, by trying how he ſucceeds, when ſitting. There is nothing more ridiculous than to ſee a man's body vibrating like a pendulum, all the while he ſings or plays.

77. When the manner of beating ſlow common time, by four motions in a bar, is become pretty familiar to the learner, he ought to proceed to the quicker mood of the barred C; in which it is proper to begin with only two motions in a bar; and indeed, after a little practice, even in the ſloweſt mood, the motions may be reduced to two in a bar; *viz.* a putting down of the hand, or toe, at the beginning of the bar, and raiſing it at the middle; then down again at the next beginning, and ſo on.

78. There are two other moods of common time, frequently uſed in Opera muſic, which are ſtill quicker than the barred C; *viz.* one marked with the ſame barred C, but inverted, which is called the retorted mood; and another marked with a 2 above, and a 4 below: ſee Exam. XVI. and XVII. The retorted mood contains the quantity of a ſemibreve in each bar; but then the length of time due to each note, is only about half of what belongs to them in the ſlow mood; ſo that the motions are about the ſame quickneſs, for two in a bar in this mood, as for four in a bar in the ſlow mood. The other, and ſtill quicker mood, marked with 2 and 4, placed in the form of a fraction, contains only the quantity of two crotchets, or a minim in each bar; and here the motions are about the ſame quickneſs for 2 in a bar, as they would be for 4 in a bar, in the mood of the barred C; and as it is moſt proper to uſe only two motions in a bar, in the mood of the barred C; ſo here it is beſt to uſe only one, *viz.* to drop the toe at the beginning of one bar, and to raiſe it at the beginning of the next, and ſo on.

79 If the entire meaſure be divided into three equal parts, and yet each of theſe parts ſub divided into 2 and 4, *etc.* like the parts of common time; this ſort of diviſion is called ſimple Triple time: for which, if the movement be ſlow, we take a pointed ſemibreve, or three minims, to a bar; and mark the mood with 3 above, and 2 below: if the movement be quicker, we take a pointed minim, or three crochets to a bar; and mark the mood with 3 above and 4 below: ſee Exam. XVIII. and XIX.

80. In order to get the proper idea of this ſort of time, the counting of a watch by 4 and 4 ſingle pulſes together, will ſtill be uſeful; but then we muſt only proceed to the number 3, and then begin with one again; inſtead of going on to 4, as in Art. 73. See a repreſentation of this way of counting, deſigned after the ſame manner, as that of the above-cited Article.



Here, as before, the meaſure is ſuppoſed always to begin at 1: and in the ſlower mood of three minims, each ſingle pulſe repreſents a quaver, and the ſingle pair repreſents a crotchet; but in the quicker mood of three crotchets, each ſingle pulſe repreſents a ſemiquaver; and the ſingle pair, a quaver.

81. For learning to beat this ſort of time, let a watch be applied to the ear, as formerly, and its pulſes counted in the manner repreſented above; put down the right hand at 1, raiſe the fingers a little, without moving the wriſt from the table, at 2; raiſe the hand towards the right ear, at 3: then down again,

at 1; and ſo on. If the foot is made uſe of, let the toe be put down, and preſſed a little to the ground, at 1; withdraw the preſſure, but let the toe remain on the ground, at 2; raiſe the toe, at 3; preſs it down again, at 1; and ſo on.

Here alſo, as before, in Art. 74, we have occaſion to recommend the frequent practice of one, or both, of theſe methods of beating triple time, with three motions in a bar; until the learner can perform the motions, in equal time, without the help of a watch: after which, he will find but little difficulty in conforming to any meaſure, whether longer or ſhorter; by making the motions reſpectively ſlower, or quicker.

A houſe-clock may ſerve, in default of a watch, by counting its ſingle beats, 1: 2: 3: 1: 2: 3: *etc.*; ſo that here, every ſingle beat of a clock ſtands in ſtead of four pulſes of a watch; and the length of each meaſure is juſt three ſeconds.

82. There are alſo two other moods of ſimple triple time, which expreſs quicker movements, and are often uſed in Opera muſic; *viz.* one marked with 3 above and 8 below; in which the meaſure contains only the quantity of a pointed crotchet, or three quavers; ſee Exam. XX.: and another marked with 3 above and 16 below, in which the meaſure is only a pointed quaver, or three ſemiquavers.

The eaſieſt way of conceiving the meaning of theſe, and all other moods, which are marked by figures, placed in the form of a fraction, is, to ſuppoſe them a real fraction, reſpecting a ſemibreve as the integer; and thus, the lower figure, or *denominator*, ſhews the number of parts into which the ſemibreve is divided; and is always either 2, 4, 8, or 16, anſwering to minims, crotchets, quavers, or ſemiquavers, reſpectively; and the upper figure, or *numerator*, ſhews how many of thoſe parts conſtitute one meaſure or bar; and in all the moods of ſimple triple time, the upper figure is always 3; becauſe it is the characteriſtic of this ſort of time, that three equal notes go to one meaſure.

83. There are ſeveral ways of naming theſe figured moods, as ſhewn in the following table.

Moods.	Names.
3 2	Three to two, three halves, Slow triple, or triple of minims.
3 4	Three to four, three fourths, Common triple, or triple of crotchets.
3 8	Three to eight, three eighths, Quick triple, or triple of quavers.
3 16	Three to ſixteen, three ſixteenths, Very quick triple, or triple of ſemiquavers.

Of theſe four ſeveral names of each mood, the laſt, which expreſſes both the ſort of time, and the conſtituent note, ſeems to be the moſt proper, and moſt intelligible. We ſhall therefore hereafter name the moods in this manner.

84. The method of beating time, deſcribed, Art. 81. which is called three in a bar, agrees very well with the triple of minims, and with the triple of crotchets in Church muſic; but in the triple of quavers or ſemiquavers, and often in the triple of crotchets in Opera muſic, the ſucceſſion is too quick to admit of three motions in a bar; and in theſe caſes it is moſt convenient to uſe only one motion for a bar, putting down the hand, or toe, at the beginning of one bar, and raiſing it at the beginning of the next bar, and ſo on: and in this way the triple diviſion of the meaſure is ſupplied by the imagination, while the motions determine nothing but the length of each entire meaſure. See Exam. XIX, and XX.

In the very quick triple of ſemiquavers, we may take ſtill greater liberty, and include two, or even four bars, under one motion: but ſtill the imagination muſt ſupply all the diviſions and ſubdiviſions, which are left undetermined by the motions of beating time.

85. As we ſometimes join together two, or four, quick triple bars, under one motion, in beating time; ſo the compoſers often join together two, or four, quick triple meaſures, in one bar; and from hence ariſe the ſorts of time called, in general, mixt triples; which are not ſo much a different ſpecies of time, as a different manner of barring the ſimple triples.

Thus the triple of crotchets, Exam. XIX. by omitting one bar, and inſerting the next, and ſo on, alternately, becomes a ſextuple, or a double triple, of crotchets, as in Exam. XXI.; and is therefore marked with 6 above: the triple of quavers, Exam. XX by proceeding in the ſame manner, becomes a ſextuple of quavers, as in Exam. XXII.

The joining of four quick triple meaſures in one bar, conſtitutes the dodecuple, or quadruple triple moods, as in Exam. XXIII, and XXIV; which are marked with 12 above: and it is evident, that any of theſe mixt moods might be brought into the form of ſimple triples, by inſerting the omitted bars, in their proper places.

86. In regard to the time of theſe mixed triples, it may generally be eſteemed ſomething quicker than that of the ſimple triples, of the ſame denomination; and the dodecuples, ſomething quicker than the ſextuples. It is for this reaſon that the ſextuple of crotchets, Exam. XXI. is directed to be beat by two in a bar, *moderate*; when the triple of crotchets, Ex. XIX. is made one in a bar, *ſlow*: in the ſame manner the dodecuple of quavers, Exam. XXIII. is called two in a bar, *moderate*; and the ſextuple of quavers, Exam. XXII. is one in a bar, *ſlow*; and ſo of the reſt.

87. We ſhall here only add the following table of mixed triples, which are in uſe among modern authors.

Sextuples, or Double Triples.

Sextuple	Of crotchets, marked,	$\frac{6}{4}$
	Of quavers, ——	$\frac{6}{8}$
	Of ſemiquavers, ——	$\frac{6}{16}$

Dodecuples, or Quadruple Triples.

Dodecuple	Of crotchets, marked,	$\frac{12}{4}$
	Of quavers, ——	$\frac{12}{8}$
	Of ſemiquavers, ——	$\frac{12}{16}$ *

88. The only ſpecies of time which now remains to be conſidered, ariſes from conceiving the three primary diviſions of ſimple triple time, to be each of them again ſub-divided into three other ſmaller parts; by which means the meaſure becomes of nine equal parts; and this is called nonuple, or compound triple time; and diſtinguiſhed by the figure 9, placed above, in the mood. See Exam. XXV, XXVI, and XXVII.

89. If the learner have attained a tolerable idea of the mixed triples laſt ſpoke of, he will meet with no difficulty in theſe. In the nonuple of crotchets, Exam. XXV. the time muſt be beat

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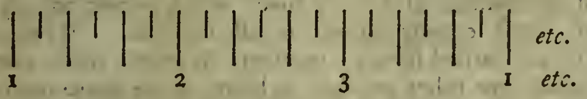
* M. Broſſard, in his *Dictionaire de Muſique*, under the word *tripola*, takes ſome pains to propoſe four other ſlower ſorts of mixed triples; *viz.* a ſextuple and dodecuple of minims, and a ſextuple and dodecuple of ſemibreves: but he ſeems not to have conſidered that the quickneſs of movement gave occaſion for the firſt riſe of theſe mixed moods, by omitting ſome of the bars, as ſhewn Art 85.: and it is for this reaſon, moſt probably, that his propoſal has never taken place.

by three motions in a bar, juſt the ſame as in the ſlow triple moods; but then the imagination muſt ſub-divide each motion into three equal ſmaller parts, in the ſame manner as it is done in the quick, or mixed, triple moods.

90. If any difficulty ſhould remain, the counting of a watch may ſtill be of ſervice, with the following directions. Apply a watch to your ear, and obſerve its ſtronger, or accented pulſes; which will immediately lead you to count the pulſes, by pairs; but inſtead of proceeding in the natural order of the numbers, 1; 2; 3; *etc.* let each number be named three times over, before you go on to the next; and after the number 3, begin again with 1; thus, 1; 1; 1; 2; 2; 2; 3; 3; 3; 1; 1; 1; *etc.* When this method is become familiar, you may drop the repetitions, and imagine the number, once named, to extend thro' the time of three pairs, or ſix ſingle pulſes, according to the following repreſentation, which is to be conceived in the very ſame manner as thoſe formerly given.



The beginning of the meaſure is always at 1; and in the nonuple of crotchets, each ſingle pulſe repreſents a quaver, and the ſingle pair a crotchet; and here the meaſure has three motions, like ſlow triple time.

91. The quicker nonuple moods of quavers and ſemiquavers ſeldom admit of more than one motion, in the whole meaſure; and as in the ſlow nonuple above repreſented, the imagination has to ſupply the triple ſub-diviſion of the time of each motion; ſo here, the imagination muſt ſupply both the primary triple diviſion of the meaſure, and alſo the triple ſub-diviſion of each part, in order to form the idea of nonuple time; when the motions of beating determine nothing but the length of the entire meaſure. See Exam. XXVI. and XXVII.

See now the following table of the nonuple moods, preſently in uſe.

Nonuple	Of crotchets, marked,	$\frac{9}{4}$
	Of quavers, ——	$\frac{9}{8}$
	Of ſemiquavers, ——	$\frac{9}{16}$

92. There are ſeveral particulars to be obſerved, in regard to the values of the reſts, or marks of ſilence, in each of theſe triple moods.

Firſt, The character commonly called a ſemibreve reſt, as in Art. 65. expreſſes the time of a complete bar in all moods; and ought never to be uſed but for that purpoſe. Thus, if inſtead of the ſecond note in Exam. XVIII. which is a ſemibreve, we had occaſion to ſubſtitute an equal time of ſilence, we muſt not uſe a ſemibreve reſt, but rather two minim reſts; becauſe here the pauſe muſt not be a whole bar, as the ſemibreve reſt would intimate, but muſt admit the following minim to complete the bar.

Secondly, The minim reſt ſtands for the time of half a bar, in all the mixt triple moods, except the dodecuple of crotchets; although the half bar is never juſt the time of a minim, being always equal to ſome one, or two pointed notes. See Exam. XXI. to XXIV. where the minim reſt is put to fill up half a bar, at the end of each Example.

Thirdly, To denote the ſilence of one fourth of a bar, in the dodecuple moods, or of one third of a bar, in the nonuple moods; which is, in each caſe, the ſilence of one of the primary diviſions of the bar, we need only to place one ſingle reſt, whoſe ordinary value is but two thirds of the diviſion; and this is the moſt uſual method in the nonuple moods. See Exam. XXV. to XXVII. where the reſt which is put at the end of each Example repreſents the complete diviſion, or third part, of the bar: and here, if it were required to denote a ſilence equal only to two thirds of the diviſion, we muſt not uſe the ſame character, although this is its ordinary value, but rather place two of the next ſhorter ſort, in its ſtead. Thus if the ſecond note of Exam. XXVI. which is a crotchet, were to be converted into an equal time of ſilence, we muſt not uſe a crotchet reſt, becauſe that character, here, repreſents the whole diviſion, conſiſting of three quavers, as at the end of the example; but we muſt rather place two quaver reſts, to prevent the ambiguity which would ariſe from uſing the ſame character, with two different meanings. In the ſame manner the ſilence of a minim, in the nonuple of crotchets, muſt be expreſſed by two crotchet reſts; and the ſilence of a quaver, in the nonuple of ſemiquavers, muſt be expreſſed by two ſemiquaver reſts.

Fourthly, As the minim reſt denotes one third part of a bar in the nonuple of crotchets, ſo, by the ſame rule, it expreſſes one fourth part of a bar in the dodecuple of crotchets; and hence ariſes a difference between the meaning of a minim reſt, in this mood, and its meaning in all the other mixt triple moods, as mentioned under the ſecond head. The minim reſt, here, repreſents only one fourth part of the bar, and to expreſs the ſilence of half a bar, we are obliged to uſe two minim reſts.

Fifthly, Upon the whole it appears, that the character we generally call a ſemibreve reſt, ought rather to be termed a bar reſt; and that the minim reſt may ſometimes be more properly called a half-bar reſt; and that if any change be occaſionally ſuppoſed in the value of the minim reſt, when taken as ſuch, or of any other of the ſmaller reſts, ſuch change is always an augmentation of one half more than their ordinary value, in order to make them equal to the principal diviſion of the bar, in ſome of the mixed or compound triple moods; and correſponds exactly with the augmentation of notes, by a point, Art. 66.

If ſuch points of augmentation had been admitted after the reſts, the comparative values of the reſts might have been kept as immutably as thoſe of the notes.

However, the method preſently received is neither hard to comprehend, nor burdenſome to the memory. It muſt be obſerved alſo, before we diſmiſs this ſubject, that theſe occaſional augmentations are not always left to the judgment of the performer; but that the moſt correct tranſcribers generally denote the quarter-bar reſt, in the dodecuple of quavers, by two characters, the firſt repreſenting a crotchet, and the other a quaver reſt. In like manner, the quaver and ſemiquaver reſts are joined together, for a quarter-bar, in the dodecuple of ſemiquavers. See the laſt bars of Exam. XXIII. and XXIV.

93. When muſic conſiſts of ſeveral parts, we obſerved formerly, Art. 61. that all the parts which go together muſt have the ſame key note; we may here add, that they muſt likewiſe all have the ſame ſpecies of time, and that the ſucceſſive meaſures of all the parts muſt begin exactly at the ſame inſtant; ſo that the motions of beating time, which anſwer to any one part, muſt equally anſwer to all the reſt. When theſe parts are carried forward together, in ſeveral ſtaffs, properly diſpoſed, one below another, as hinted in the above-mentioned Article, the bars which divide the meaſures of the ſeveral parts, ought to fall directly under each other; and this is called muſic *in ſcore*.

It often happens, that ſome of theſe parts are to reſt, or be ſilent, for ſeveral bars together; in which caſe, if the muſic be wrote in ſcore, the bars are drawn in the ſtaves belonging to the ſilent parts, as well as in the other, and every ſilent bar is marked with a bar reſt: but if the different parts are written out in ſeparate books, the ſilence of a number of bars is expreſſed by placing one ſingle bar reſt, with a figure over it, to ſhew how many of ſuch ſilent bars is thereby meant.

94. In the performance of muſic, there is a certain emphaſis, or accent laid on the beginning of every meaſure, which plainly

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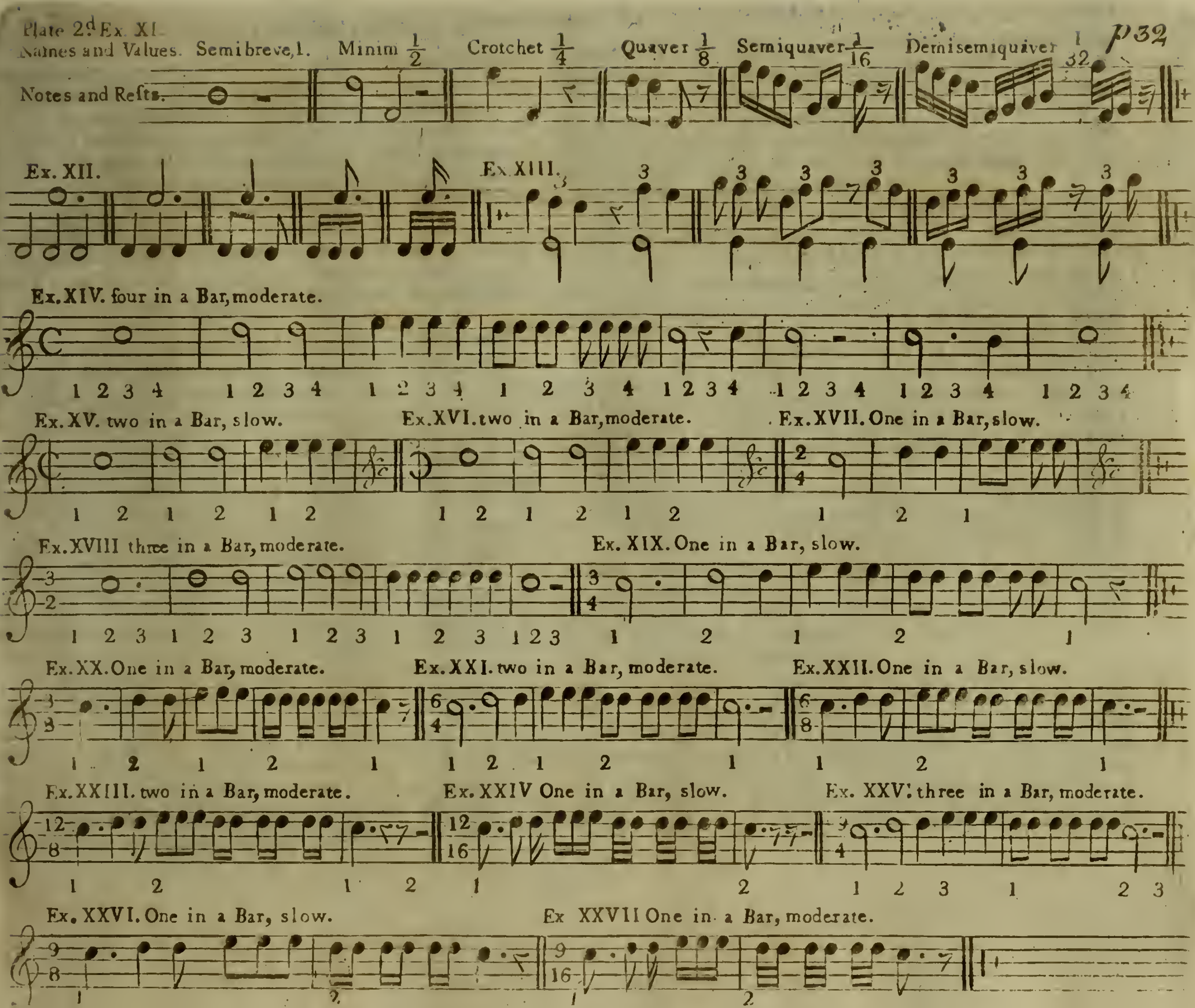
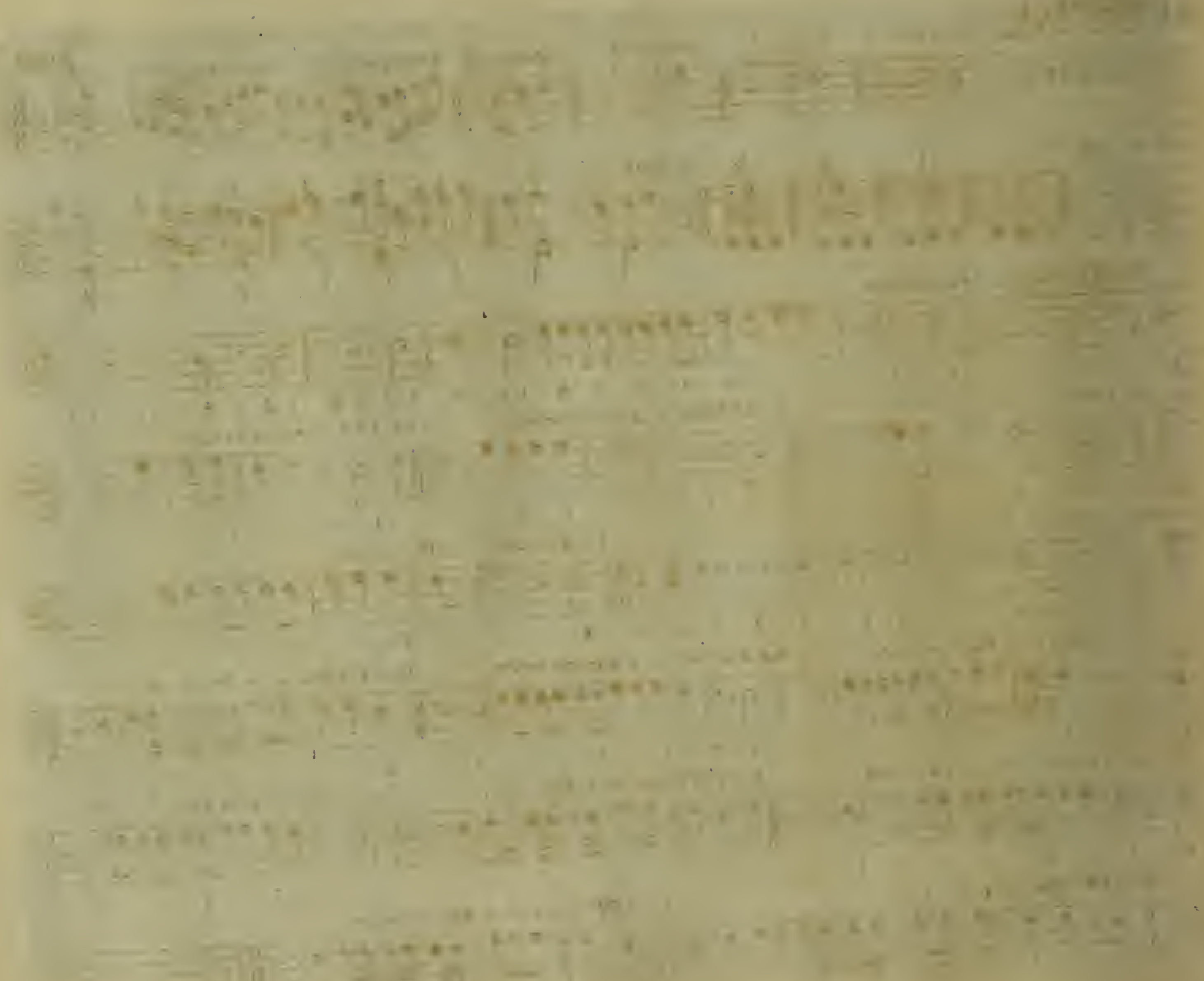


Plate 2d Ex. XI
Names and Values. Semibreve, 1. Minim 1/2 Crotchet 1/4 Quaver 1/8 Semiquaver 1/16 Demisemiquaver 1/32
Notes and Rests.
Ex. XII.
Ex. XIII.
Ex. XIV. four in a Bar, moderate.
Ex. XV. two in a Bar, slow.
Ex. XVI. two in a Bar, moderate.
Ex. XVII. One in a Bar, slow.
Ex. XVIII three in a Bar, moderate.
Ex. XIX. One in a Bar, slow.
Ex. XX. One in a Bar, moderate.
Ex. XXI. two in a Bar, moderate.
Ex. XXII. One in a Bar, slow.
Ex. XXIII. two in a Bar, moderate.
Ex. XXIV One in a Bar, slow.
Ex. XXV. three in a Bar, moderate.
Ex. XXVI. One in a Bar, slow.
Ex XXVII One in a Bar, moderate.



diſtinguiſhes one ſpecies of time from another; ſo that a hearer is naturally led to diſtribute a tune into its proper meaſures, though he ſhould take no notice of the manner of beating time; nay, though he ſhould know nothing at all of the rules relating to the time of muſic. We are naturally pleaſed with equal-timed meaſures, divided and ſub-divided in certain eligible manners; but it is a work of time and ſpeculation to aſcertain what thoſe diviſions are, which give us pleaſure.

The emphaſis always falls upon the number 1, in the methods of counting a watch, or clock; and accompanies the putting down of the hand, or toe, in beating time, as directed above.

95. There is no occaſion to make the beginning, or emphatical part, of the meaſure, always ſtronger, or louder than the reſt, though it is ſometimes beſt to do ſo; for, it is not ſo much the ſuperior loudneſs of the ſound, as the ſuperior regard which a hearer is led to beſtow upon it, that diſtinguiſhes one part of the meaſure from another. This is a truth of great importance, as will hereafter appear, and deſerves to be well fixed in mind, before we proceed. For illuſtration of this, it may be obſerved, in the method of counting a watch, repreſented, Art. 73. that although the alternate ſtronger pulſes, repreſented by the longer lines, be undoubtedly all equal, yet when we count one, and paſs over the next, and count the next, and paſs over the next, and ſo on; we imagine the pulſes which we count, to be really ſtronger than the intermediate ones, which we paſs over. The ſuperior regard which we beſtow on the counted pulſes is, here, the ſole cauſe of theſe imaginary accents.

Again, in the method of counting a watch, repreſented, Art. 90. the pulſe which we count acquires a greater emphaſis, than either of the two following equal ones, which we paſs over.

If we extend theſe obſervations ſtill further, we ſhall find, that in all the methods of counting a watch, the pulſe which anſwers to 1, that is, the pulſe which begins the meaſure, ſeems ſtronger than any of the others; eſpecially after we have continued the ſame method of counting, for ſeveral times over. We ſhall find, alſo, that the pulſe which anſwers to the number 3, in common time, will ſeem ſtronger than either of thoſe which anſwer to 2, or 4; and even in triple time, the ſame number 3, is more emphatical than 2.

The caſe is juſt the ſame with the ſucceſſive ſounds of muſic, becauſe we naturally conceive theſe ſounds, as poſſeſſing ſuch and ſuch parts of the eſtabliſhed meaſure of the piece. The regard, paid to the beginning of every meaſure, renders the note, which poſſeſſes that part, more remarkable, and therefore, more emphatical, than any of thoſe which occupy the other parts of the meaſure; the beginning of the third diviſion of the meaſure, is alſo accented, in a ſmaller degree, both in common and triple time; and the beginning of every primary diviſion of the meaſure is more emphatical than that of any of the ſecondary ſub-diviſions. All theſe remarks are direct conſequences from the foregoing obſervations.

96. From hence, it appears, that the ideas of the length of the whole meaſure, and of its proper diviſions and ſub-diviſions, are as conſtantly kept in mind, through the courſe of a tune, as the key note was obſerved to be, in Chap. II.: and that the conſtant rememberance of the meaſure and its diviſions regulates the time, and accent, of each ſound which we uſe; much in the ſame manner as the key note determines the tune or pitch of all thoſe which follow it.

97. To preſerve the idea of the proper diviſion of the meaſure, it is beſt for a beginner to divide all the long notes which occur into parts, anſwering to the parts of the meaſure which it occupies, by making ſeveral diſtinct *ſwells* in the ſound; and this may be very eaſily done with the voice or violin, or any wind inſtrument; but is impracticable in the pulſatile kind, ſuch as, the harpſichord, lute, harp, guitar, *etc.*; becauſe the

ſounds of theſe inſtruments muſt inevitably decreaſe from firſt to laſt, and are not capable of any ſwells, without repeating the ſtroke: and hence we may conclude that it is much more difficult to keep true time, with ſuch inſtruments, except the voice be accuſtomed to go along with them.

For an inſtance of this way of dividing long continued ſounds, let a learner ſing the beginning of Exam. XIV. which is in ſlow common time, and directed to be beat with 4 motions in a bar; applying the ſyllable *la* to each note.

Here the firſt note, being itſelf a complete bar, muſt employ all the four motions; let it therefore have four diſtinct and equal ſwells, anſwering to the four motions, or parts of the bar, thus, *la—a—a—a*.

The ſecond and third notes, by the ſame rule, are to have two ſwells each, thus, *la—a*, *la—a*.

The four next notes, which conſtitute the third bar, are juſt equal to the four diviſions of the meaſure; and therefore are ſung, ſimply, *la*, *la*, *la*, *la*. It is to be obſerved, that theſe ſwells are of no uſe, except when ſome primary diviſion of the meaſure begins within the time of one continued note.

98. All notes, which, by being longer than the primary diviſion of the meaſure, muſt neceſſarily belong to two, or more, diviſions, may be diſtinguiſhed into *protracted* and *ſyncopated* notes. Such as begin with a part of the meaſure which has an equal, or a greater emphaſis than any of the ſucceeding parts which they are continued upon, are called protracted or lengthened notes; but ſuch as begin with a leſs emphatical part, and are afterwards continued upon a more emphatical part, are called ſyncopated notes: or, in other words, the protracted note is moſt accented at the beginning, and the ſyncopated note is moſt accented ſome time after the beginning*.

The ſyncopated note often happens to be prolonged from the end of one meaſure to the beginning of another; in which caſe, if it be a ſemibreve or a minim, and one half of it belonging to each meaſure, the bar may be drawn down through the middle of the note; or it may be repreſented by two ſhorter notes, with the bar between them, and an arch drawn over the whole; which ſhews that they are be conſidered as one note: ſee the letter M, in Plate III. Exam. XXVIII.; where the notes in the lower ſtaff are deſigned as a kind of explanation of thoſe in the upper ſtaff.

Sometimes a note, at the end of one meaſure, is carried on to the beginning of the next meaſure, by means of a point of augmentation, in which caſe the bar is drawn between the note and the point: ſee letter N in Exam. XXVIII. where the pointed note in the upper ſtaff is explained below.

The notes at H, I, K, in this Example, are to be eſteemed protracted notes; and thoſe at L, M, N, O, P, Q, are ſyncopated.

99. If it be convenient to divide the protracted note into diſtinct ſwells, for preſerving the proper idea of the time, as directed Art. 97.; it is much more neceſſary, to divide the ſyncopated note in this manner, by making a perceivable ſwell when the accented part of the meaſure begins; and this is the reaſon why we generally find it beſt to ſtrike theſe notes twice, in playing the harpſichord, or any other pulſatile inſtrument, after the manner repreſented in the lower ſtaff of Exam. XXVIII.

100. When an equal time of ſilence is ſubſtituted inſtead of a ſyncopated note, we uſe two characters repreſenting the two parts of the note, as it ought to be divided by the ſwell. Thus, if the note at L, were to be converted into a ſilence, we muſt place two crotchet reſts, rather than a minim reſt. In like

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* The word *ſyncopated* takes is riſe from a Greek verb, SYNKOPTO, which ſignifies to beat or ſtrike, and probably has been appropriated to theſe ſorts of notes, becauſe it generally happens, that we are to make one of the motions of beating time, during the continuance of the note.

manner, any of the notes at O, P, Q, muſt be repreſented by two quaver reſts, rather than a crotchet reſt.

101. The diviſion of muſic into equal timed *meaſures*, anſwers exactly to the diviſion of poetry into *feet:* and when muſic is adapted to poetry, theſe diviſions, moſt naturally, coincide with each other; ſo that he who can *ſcan* the verſes, may immmediately diſcover the meaſure of the ſong.

It muſt be acknowleged, that this order is pretty often interrupted, eſpecially in the works of the more eminent compoſers; and more, or leſs, than one foot of the poetry, allotted to one meaſure of the muſic: but then, ſuch paſſages are, in ſome degree, ſtrained and unnatural; and are introduced for variety, or for heightening the expreſſion of ſome paſſion, *etc.* and ought to be uſed with great caution and ſkill.

The moſt natural and eaſy paſſages are expreſſive of a calm unruffled temper of mind; but when any violent emotion is ſuppoſed to take place, the ſtrict rules both of tune and time, in muſic, may, and ought to be partly ſet aſide.

102. Our attention is ſtill more liable to be diverted from obſerving the ſtrict rules of time, by the ſenſe of the words, in poetry; but ſo far as we may be ſuppoſed at liberty to regard the time, of poetry, we ſhall find that the very ſame rules take place here, as in muſic; *viz.* the ſucceſſive feet of a verſe, moſt naturally, require each an equal time of pronunciation; the firſt ſyllable of every foot is accented; and every foot is, in imagination, divided either into three, or into four, equal parts. The two firſt of theſe particulars will plainly appear to all, who are, in the leaſt degree, accuſtomed to the reading of poetry; and the laſt particular, though not quite ſo obvious, will be found equally true, on a more careful examination.

103. Beſides the diſtribution of muſic into equal meaſures, it is alſo neceſſary to go yet further, and to imagine ſome numbers of ſuch meaſures, as conſtituting certain *phraſes*, or *ſtrains*, of a tune. Theſe phraſes may, very aptly, be compared with verſes, in poetry: for, as there can be no poetry, without a proper intermixture of cadences, at the ends of the lines, ſo there can be no muſic, without ſome kind of partition into phraſes.

Theſe phraſes contain more, or fewer meaſures, as verſes conſiſt of more or fewer feet; but both muſt always end with an accented part of the meaſure.

When the ſucceſſive phraſes in muſic are of unequal lengths, it reſembles that kind of free, unconfined poetry, which is commonly called *Pindaric:* and, as this ſort of compoſition is the moſt capable of variety of expreſſion; ſo, the greateſt maſters, both in poetry and muſic, often make uſe of it.

104. A lively expreſſion of the ſeveral ſentiments and paſſions, is undoubtedly the perfection of muſic, as well as of poetry and painting. There are numberleſs different modifications of ſounds, which a ſkilful compoſer may avail himſelf of, for this purpoſe; ſuch as the different qualities of loud and ſoft, of hoarſe or rough, and clear or ſmooth ſounds: the various degrees of gravity and acuteneſs, in the *pitch* of the whole piece; the different effects of certain degrees of the ſcale, and of certain ſucceſſions in the melody of ſingle parts, as well as of conſonances, in the harmony of compounded parts; beſides ſeveral other circumſtances in the manner of performance, ſuch as the diſtinct, or *ſtepping*, and the indiſtinct, or *ſliding* manner; the keeping one uniform equality of loudneſs, and the occaſional ſwelling or ſoftening of the ſounds, *etc.*; and, among the reſt, the different moods of time, have no ſmall ſhare in contributing to the expreſſion of muſic. Theſe come in courſe to be ſpoke of, before we conclude this Chapter.

105. The particular manners, and modulations of the voice, which, *naturally*, or by the cuſtom of a particular country, *habitually* accompany ſuch emotions of the mind, in common ſpeech, are the ſureſt guides to expreſſion in muſic. From hence we conclude, in general, that ſlow or quick movements of muſic

ought to be introduced, according as the ſentiment, intended to be expreſſed, would require a ſlow or quick delivery, in the way of ſpeaking: and of this it is very eaſy to judge. For inſtance, ſorrow, humility, and reverence, require a ſlow movement, with gentle, eaſy inflexions of the voice; but joy, thankſgiving, and triumph, ought to be diſtinguiſhed by a quicker movement, with bolder inflexions, and more diſtant leaps, from one ſound to another. A moderate movement, with frequent ſwells, and ſoftenings, is expreſſive of tenderneſs and compaſſion; a quicker, more uniform, and ſtrongly accented movement, expreſſes reſolution and fortitude. Anger is generally quick, loud, and unconnected; hope and expectation, more moderate, ſoft, and eaſy, and ſo of others.

106. The different ſorts of time have, in ſome degree, each their peculiar character. Common time is naturally more grave and ſolemn; triple time, more chearful and airy. And for this reaſon, it is generally agreed, that every mood of triple time ought to be performed ſomething quicker, than the correſpondent mood of common time; for inſtance, the meaſure in the ſlow triple of minims, ought to be made ſhorter than the meaſure in the ſlow common time, marked with a plain C; and the meaſure, in the triple of crotchets, ſhould be ſhorter than the meaſure, in the mood of the barred C; and ſo on.

After all, it muſt be acknowleged, that the abſolute time which ought to be allowed to different pieces, is the moſt undetermined matter, that we meet with, in the whole ſcience of muſic. There is one inſuperable difficulty, which fruſtrates all attempts towards regulating this particular, *viz.* the different humours and taſtes of different perſons; which are ſo various, that one perſon ſhall think a tune much too quick, for the intended expreſſion, while another thinks it not quick enough.

107. If we proceed upon theſe principles, which ſeem moſt reaſonable, that thoſe who have a briſker flow of ſpirits, a more ready conception, and a quicker ſucceſſion of ideas, require quicker muſic, for the ſame expreſſion, and *vice verſa;* we may conclude, in regard to Church muſic, that the ſame Pſalm ought to be ſung quicker, when the congregation conſiſts moſtly of young people; and ſlower, when the greater part are old: quicker, in general, in a town, than in a country church; quicker, in places where muſic is more generally practiſed; and ſlower, where it is leſs in uſe: quicker, when only one ſingle part is ſung, and ſlower, as the parts are more numerous; becauſe the ideas of ſingle ſounds are much more readily conceived, than thoſe of ſeveral ſounds, joined together in harmony: quicker, when the voices are few and weak, and ſlower, when the choir is numerous and ſtrong; becauſe nothing can be quite agreeable to the hearers, which ſeems laborious to the performers. Many other ſuch like diſtinctions, according to the various circumſtances, both of performers and hearers, will occur to the conſiderate reader, from the ſame principles. Theſe obſervations may, with equal propriety, be extended to Opera muſic.

The Italians, whoſe compoſitions are juſtly eſteemed the ſtandards of true taſte in muſic, do not reſtrict themſelves altogether to the diſtinctions of ſlow and quick, by the ſeveral moods, as above deſcribed; but rather make uſe of certain words, placed at the beginning of the piece, and elſewhere, as occaſion requires; which ſerve to direct the performer, not only in regard to the time, but alſo the particular expreſſion, and manner of performance, as we ſhall ſhew in the next Chapter.

108. We ſhall conclude this Chapter, with obſerving, that the writers on Church muſic ſeem to be pretty well agreed, that the time of a ſecond, may ſerve, at a medium, for the length of a crochet, in Pſalm tunes, in the triple of crotchets, and in the mood of the barred C; and that the minim, in the triple of minims, ought to be made nearly equal to the crotchet, in the mood of the plain C; and that either of theſe two ought to be longer than the ſecond of a clock.

CHAP. V. MISCELLANEOUS EXPLANATIONS.

Article 109. THERE are ſeveral other characters and terms uſed in muſic, which have not yet come under conſideration. We ſhall, in this Chapter, explain ſuch of them as are moſt frequently met with, and moſt neceſſary to be underſtood.

A *double bar* is uſually put at the end of every line, in Pſalm tunes; but in other kinds of muſic the double bars are not ſo frequent, and are uſed only at the ends of ſome larger ſections, or *parts* of the tune.

When the laſt meaſure, or bar, of the part is complete, the double bar alſo ſupplies the place of a ſingle bar, for dividing the time, as mentioned, Art. 70. *et ſeq.*: but the double bar often takes place when the meaſure is not complete, in which caſe, the remainder of the meaſure follows immediately after, and the double bar ſhews only the end of the ſection or part, but is of no ſignification in reſpect to the diviſion of the time.

It muſt be obſerved, that although the double bar, when it occurs, makes no change in the progreſſion of the meaſure and its diviſions, as denoted by the ſingle bars; yet it generally implies a pauſe in the performance; but then it is a different kind of a pauſe from thoſe which we call reſts, as explained in the laſt Chapter: the meaſure is conceived as regularly going on during the time of the reſt; but the double bar implies a kind of unlimited, or diſcretionary pauſe, not only in the progreſſion of ſounds, but alſo in the meaſure itſelf: or, in other words, the reſt is a meaſured ſilence, but the pauſe, at the concluſion of a part, is unmeaſured; and may be made longer or ſhorter, at pleaſure.

110. The ſame kind of unmeaſured pauſe or ſuſpenſion is often introduced in the middle of a piece, to give the finger an opportunity of dwelling upon ſome particular word, beyond its due time, for heightening the expreſſion, or for other reaſons, at the diſcretion of the compoſer, and is called *a hold*.

The *hold* is denoted by a ſmall arch, with a point in the middle, placed over or under the note which is intended to be prolonged, thus 𝄐 or thus 𝄑.

The ſame character ſometimes ſhews that the note, to which it is affixed, is to be the laſt, or cloſing note of the piece; and is then called *a cloſe*. This becomes neceſſary when a piece of muſic is to be finiſhed with a repetition of ſome of the firſt or middle parts.

The double uſe of this character, *viz.* as a hold, and as a cloſe, cauſes no ambiguity: for it is plain, as was obſerved in the laſt article, that the cloſe always implies a hold; and whenever this mark is uſed, ſimply as a hold, the unfiniſhed expectation of the ear infallibly ſhews, that it cannot, in that ſituation, be conſidered as a final cloſe.

111. The *repetition* of ſome certain part of a piece of muſic is marked by points affixed to the double bars, or by a pointed .S· placed over the beginning, or end, of the part to be repeated; when it happens not to begin, or not to end, at a double bar.

Exam. XXIX. Plate III. repreſents ſeveral varieties of repetitions, which will fully ſuffice for the learner's information in this matter. It is to be obſerved, that each letter, which ſtands in the ſtaff of lines, repreſents a portion of muſic, which may be, and generally is, of a conſiderable length, comprehending ſeveral ſingle bars, or meaſures, although the letters are crouded near together, and no ſingle bars placed in this Example; which is done for the ſake of including all the varieties in one ſtaff of lines.

The portions H, I, K, are each to be repeated, becauſe of the points at the two firſt double bars: the pointed .S·, between K and L, ſhews that the repetition extends only to the part K, ſo that we muſt not proceed to the part L, till after K has been repeated. The parts L and M are not to be repeated, becauſe the double bar which ſeparates them, is not pointed; but the part N muſt be repeated, becauſe of the .S· at the beginning, and the points preceding the double bar. O is not repeated, but at the beginning of P we have the mark for a repetition, which extends over one double bar, not pointed, and to the next double bar; ſo that, after P and Q have been once gone through, we muſt return to P again, and ſo go forward. The part R is to be once performed, S is to be repeated becauſe of the marks, and T is not to be repeated. See the order of the parts ſubjoined to the Example.

At the concluſion of ſome portions of muſic, we often find two parcels of notes, tied together by arches over, or under each; with the figure 1, in the former arch, and 2, in the latter; this always intimates a repeat, and ſhews that, for the firſt time, we are to take the notes marked, 1; and when we come to the ſame place, a ſecond time, we are to paſs over the notes at 1, and take thoſe marked, 2.

112. *Da capo* or D. C. at the end of a piece ſignifies that we are to begin again at the head and conclude with the firſt part. *Dal' ſegno* ſignifies that we are to begin again at ſuch a certain mark, as at a pointed .S·, or any other mark, at the tranſcriber's pleaſure; but it is beſt to put the ſame mark, intended to be referred to, over, or after the words *dal' ſegno*, to prevent miſtakes; when ſeveral marks have occurred in the preceding piece.

In theſe pieces the cloſing note ought to be diſtinguiſhed, as mentioned, Art. 110.

113. A kind of ſmall *W* put upon any line or ſpace is called a *direct* or *index*. This is often put at the end of a ſtaff of lines, to ſhew the place of the next note in the following ſtaff, and eſpecially when the ſtrain is incomplete.

Volti at the foot of a page ſignifies, turn over; *Volti ſubito*, is, turn over quickly. The tranſcribers of inſtrumental muſic ought to avoid as much as poſſible, the breaking of a connected ſtrain, at the foot of a page, becauſe of the inconvenience, and loſs of time, in turning the leaf.

114. An arch over or under ſeveral notes, is called a *tye* or *ſlur*; and ſhews that all the included notes belong to one ſyllable, in vocal muſic. The ſame mark, in inſtrumental muſic, ſhews that the ſound muſt be made to ſlide from one note to another, without any breaking off, or interruption; ſo as to imitate the voice, as nearly as the nature of the inſtrument will admit. How this and other ſuch like effects are to be produced on any particular inſtrument, may be learned from the inſtruction books which are compoſed expreſsly for that inſtrument; and ſtill better from the directions and examples of experienced maſters; but does not belong to this place: as we propoſe only to give the general Rudiments of the Art, which in ſome meaſure concern all ſorts of performers. We ſhall only obſerve, that a great part of the merit of all inſtrumental performance conſiſts in a ſtriking imitation of the natural inflexions of the human voice; and it is on this account that we often ſay, a maſterly performer makes his inſtrument *ſpeak*; and thus, it was ſaid of the late inimitable *Sigr. Tartini*, that he made the violin *ſing*, rather than *play*.

There is indeed no other inſtrument as capable of this imitation as the violin; but then all others may ſafely be pronounced defective, in ſo far as they fall ſhort of it.

This may ſerve to apologize for the frequent addreſſes we have hitherto made, and ſhall hereafter make, to the ſinger in particular; becauſe the human voice is the true ſtandard of all muſic; and he who knows how a paſſage ſhould be ſung, knows alſo how it ſhould ſound, when played; and wants only to become ſo far a maſter of his inſtrument, as to be able to reduce his knowlege to practice.

The *ſtaccato*, which is marked by ſmall perpendicular daſhes over each note, is juſt the reverſe of the ſlur; and ſhews that the notes muſt be ſeparated more diſtinctly than ordinary.

115. *Forte*, ſometimes wrote, by contraction, *F^e*. ſignifies ſtrong or loud. *Piano*, or *P^o*. ſignifies weak or ſoft. The ſuperlatives *Fortiſſimo* and *Pianiſſimo* are ſometimes uſed, to denote extreme loudneſs and ſoftneſs, reſpectively. *Moderato*, expreſſes the mean between theſe.

116. The ſhake or *trill* is marked by *tr*, put over a plain note: this is by far the fineſt grace in muſic, and generally coſts the performer the moſt pains to acquire it. It may, with ſufficient propriety, be called a quick, alternate repercuſſion of two ſounds, whereof the lower is repreſented by the note itſelf, and the upper is the next ſuperior degree of the ſcale. The ſinger, who would attain this capital qualification of executing a ſhake, muſt begin with ſounding two contiguous degrees of the ſcale alternately, and *ſlowly*; increaſing the quickneſs of ſucceſſion, as the voice grows more flexible: he muſt be particularly careful to let each ſound be clearly and diſtinctly heard, every time he recurs upon it; leſt, by too much eagerneſs to arrive at a quick execution, he run the hazard of acquiring an indiſtinct and confuſed one; which is more properly *ſtammering*, than *ſinging*.

Sometimes the note next below that marked with the trill is inſerted, juſt before the end of the ſhake, as ſhewn, Ex. XXX. and then it is called a turned ſhake. At other times, none but the two principal notes are uſed, as in Exam. XXXI. and then it is called a plain ſhake. Sometimes the ſhake is not begun till one half of the note be ſung plain. Theſe and other ſuch varieties are generally left to the performer's choice, being all indiſcriminately marked in the ſame manner, except in leſſons intended only for one particular kind of inſtrument; where the ſeveral graces, proper for that inſtrument, are ſpecified by ſeveral marks, eſtabliſhed for that purpoſe; and of which every different kind of inſtrument admits of a different collection.

117. The occaſional inſertion of other notes beſides thoſe repreſented in the written muſic, when judiciouſly managed, adds greatly to the ſpirit of a performance; but then, ſuch freedoms ought to be uſed with great diſcretion, and ſeldom with any other view than that of imitating the natural inflexions of the voice; if this be diſregarded, and a luxuriant fancy let looſe, the true deſign of the compoſer is ſure to be buried under a heap of extravagant flouriſhes and graces; which are neither conſiſtent with the original deſign, nor with each other.

In written muſic, and eſpecially in the vocal parts, we often find notes of a ſmaller ſize inſerted here and there, which are not to be reckoned in the time, for the bars are complete without them. Such a ſmall additional note is called an *appoggiatura*, which word is derived from the Italian verb *appoggiare*, to lean or reſt upon, probably becauſe the voice ought to touch, and make ſome ſtay upon that ſound, in its paſſage from the preceding, to the following *principal* note. The *appoggiatura* ſhould always be tied to one of the principal notes; and, tho' we are not ſtrictly obliged to give it juſt the time which its figure would require, yet whatever length of time is beſtowed upon it, muſt be, as it were, borrowed from the principal note with which it is tied; ſo that the *appoggiatura* and principal note, both taken together, may be no longer than the principal note would be of itſelf. See Exam. XXXII.

Theſe ſmall notes may be looked upon as the finiſhing touches of the compoſer, and the trueſt ſpecimens of ſuch occaſional inſertions as are ſuitable to the genuine ſpirit of the piece.

118. Vocal muſic is diſtinguiſhed into *Recitative* and *Air*. The word *Recitative* comes from *recitare* to recite or rehearſe; and expreſſes a particular ſtyle of muſic, nearly related to the manner of ſpeaking, which may be called a kind of muſical declamation.

The chief difference between recitative, and declamation, lies in the difference between a muſical tone, and natural ſpeech, obſerved in the former note to Art. 21. This ſort of muſic is wrote with as much regularity of time and meaſure, as any other; but yet the ſinger is more at liberty to tranſgreſs the ſtrict rules of time, for the ſake of expreſſion. In general, the ſentiment ought to engage our attention, more than the muſic, in *Recitatives;* and the muſic, more than the ſentiment, in *Airs*.

119. *Symphony* is a term applied only to certain kinds of inſtrumental muſic; when this is interſperſed with vocal, the parts belonging to each are diſtinguiſhed by the words *ſymphony* and *ſong*, or *Sy*. and *So*. placed at the beginning of each. An introductory or initial ſymphony is called an *Overture* or *Prelude;* and thoſe which are interſperſed with the ſong are called *interludes*.

120. A *Solo* is an air for one ſingle part, or one part and a Baſs. A *Duo* is for two parts with, or without, a Baſs: the diminutive *Duetto* is the ſame as a ſmall or ſhort *Duo*. A *Trio*, is for three parts. A *Chorus* is when ſeveral parts join together in full harmony.

A *Minuet* is an air, in briſk triple time, generally conſiſting of two parts, each being repeated. It ought to begin with an accented note, *i. e.* with the beginning of a meaſure, and to be wrote in the mood of triple quavers: we frequently write them in the triple of crotchets, which makes no material difference, becauſe the name itſelf determines the quickneſs of the time.

A *Saraband* is much the ſame air as a Minuet, but in a ſlower movement.

A *Gig* is a very quick and ſprightly air in triple time, and generally in the dodecuple, or nonuple, of quavers; which often moves by large intervals or leaps, and is therefore ſometimes called *Saltarella*, from *ſaltare*, to leap.

A *March*, is a martial air in pretty briſk common time; and has its name from its uſe in military exerciſe.

A *Gavot*, is an air in common time, always equally divided, and diſtinctly accented, and for the moſt part pretty quick.

An *Allemand*, is in ſlow common time. All theſe different airs generally conſiſt of two parts, each to be repeated, as was obſerved of the Minuet.

A *Muſette*, is an air in a particular ſtyle, ſo called from the French, *une muſette*, which is an inſtrument of the ſame ſpecies with our bag-pipe. Its movement is moderate, and moſt frequently in common time.

The names *Hornpipe* and *Rigadoon*, belong to certain ſpecies of dances, to which the tunes are adapted.

121. When a portion of muſic falls under no particular denomination expreſſive of the time and manner of performance, the Italians uſe other words for that purpoſe; which being in ſome meaſure adopted by all civilized nations, are become a kind of univerſal language among muſicians. We here ſubjoin a ſpecimen of ſuch as firſt occurred, ranked in alphabetical order; acknowleging at the ſame time that there are ſeveral, purpoſely omitted, which relate to particular inſtruments only; and may, very probably, be others overlooked, of equal uſe with ſome of theſe: for, in truth, the Italians freely make uſe of any word which ſeems moſt ſuitable for their purpoſe; and almoſt every new author introduces new terms of his own, ſo that the half of the Italian language would ſcarce be too much, for a muſician to underſtand, in reference to his own art.

Adagio, *q. d.* at leiſure, expreſſes a ſlow, eaſy movement. When twice repeated, thus, *Adagio Adagio*, it expreſſes a very ſlow movement.

Ad libitum, [Latin,] at pleaſure. Theſe words placed at the beginning of certain ſtrains, ſignify, that the time may be made quicker or ſlower, equal or unequal, at the performer's diſcretion.

Affettuoſo, affectionately. A moderate movement, with frequent ſwells and ſoftenings.

Allegro, gay. A pretty briſk and ſprightly movement. The diminutive *Allegretto* is leſs gay and ſprightly, and therefore not quite ſo briſk a movement, as *Allegro*.

Amoroſo, amorous. Nearly the ſame as *affettuoſo*.

Andante, walking. A regular, diſtinct, and moderate movement. The diminutive *andantino* is ſomewhat quicker than *andante*, as if it were to be meaſured by a little *mincing ſtep*.

Andante allegro. A regular, diſtinct, and pretty briſk movement. A diſtinct *allegro*.

Animato, bold. A pretty briſk movement, with a firm and bold manner: a bold *allegro*.

Arioſo, airy. A ſtyle and manner reſembling ſinging.

Aſſai, enough. As *Aſſai allegro*, ſignifies a ſufficient degree of briſkneſs, but not too much.

Brillante, brilliant. A pretty briſk movement with a pleaſant and jocund manner: a mirthful *Allegro*.

Brio, vivacity. See *Con*.

Cantabile, that may be ſung. Nearly the ſame as *Arioſo*.

Con, with. As *con brio*, or *con ſpirito*, with ſpirit; *con dolce maniere*, in a ſweet, agreeeable manner; *con diligenza*, with care and exactneſs; *con furia*, with fury, or in a violent and rapid manner.

Creſcendo, increaſing. This word following *piano*, or preceding *forte*, ſhews that the ſound muſt increaſe and grow gradually ſtronger.

Diligenza, care. See *Con*.

Dolce, ſweet. See *Con*.

E, or *ed*, or *et*, and. As *dolce e piano*, ſweet and ſoft. *Andante ed affettuoſo*, regular, diſtinct and affectionate.

Ecco, echo. The repetition of ſome part of a ſtrain, in a ſoft manner, imitating a natural echo.

Furia, fury. See *Con*.

Fine, or *il fine*, the end. This is ſometimes uſed inſtead of the character called a Cloſe.

Gratioſo, graceful. A moderate movement, nearly the ſame, but not ſo pathetic, as *affettuoſo*.

Grave, grave. A ſlow and ſolemn manner. Some authors define it a movement, ſlower than *Adagio;* others, a degree quicker than *Adagio;* but it ought, probably, to be conſidered rather as a particular manner, than a mood of time.

Languente, or *Languido*, languiſhing. A ſlow, plaintive manner.

Largo, large, or ample. A ſlow movement. There are different explanations given of this word. Some will have it, a large, and frequently, unreſtricted meaſure, ſlower than *Adagio;* others, more conformably to its modern acceptation, define it, a ſlow *Andante;* but not ſo ſlow as *Adagio:* and in this ſenſe *Largo*, compared with *Andante*, is like an ample ſtride, compared with an ordinary ſtep. The diminutive *Larghetto*, is ſmaller, or leſs ample; and therefore denotes a movement ſomething quicker.

Lento, ſlow. A movement nearly the ſame as *Largo*.

Ma, but.

Maeſtoſo, or *Maeſtuoſo*, majeſtic. A ſlow movement, with a bold and emphatical manner.

Men, or *Meno*, leſs. As *men forte*, leſs ſtrong, or not ſo loud; *men allegro*, leſs gay.

Mezzo, half. As *mezzo forte*, a middling degree of ſtrength.

Moderato, moderate. This word is often put to expreſs a moderate degree of any quality; as *Allegro moderato*, moderately gay.

Non, not.

Piu, more. As *piu piano*, or *P. P.* more ſoft; *piu allegro*, more gay.

Poco, or *un Poco*, a little. As *un poco allegro*, a little gay; meaning much the ſame as *Allegretto. Un poco piu*, and *un poco men*, expreſs a little more, and a little leſs, that is, an increaſe and diminution, of any quality, to which theſe words are prefixed.

Preſto, quick. A quick movement. The ſuperlative *Preſtiſſimo* denotes a very quick movement.

Rondo, or *Rondeau*, [French,] a piece which concludes with a repetition of the firſt part.

Senza, without. As *ſenza Violini*, without violins.

Siciliana, Sicilian; of, or belonging to Sicily. A particular air in triple time, wrote in the ſame mood as our Gig; but much ſlower, and better adapted for ſinging.

Stentato, painful. A forced, ſtraining manner; expreſſive of the crying of a perſon in pain.

Tardo, lazy. A ſlow, and ſeemingly idle, or negligent manner.

Tempo, time. *A tempo*, or *A tempo giuſto*, placed after a Recitative, or other free and irregular piece, denotes that the time muſt be juſtly kept in the part which follows. *A tempo ordinario*, placed at the beginning of a piece, of a well known ſtile and movement, ſhews that it is to be performed in the ordinary and accuſtomed time. *Tempo di Minuetto, di Gavotta*, etc. denote that the following part is to be performed in Minuet time, in Gavot time, *etc.*; though it be not properly a Minuet, Gavot, *etc.*: becauſe not reſtricted to the particular length of ſtrains, and the repetitions which characterize theſe airs.

Timoroſo, timorous. A faint and trembling manner; expreſſive of fear.

Troppo, too much. As *Allegro ma non troppo*, gay, but not too much ſo.

Tutti, all. This word is often placed after a Solo, or other piece, for certain detached parts; and ſhews that all the parts are to join, in what follows.

Vigoroſo, vigorous. A bold and firm manner, expreſſing reſolution and fortitude.

Vivace, lively. A lively and ſpirited manner; near the ſame, but not quite ſo briſk a movement, as *Allegro*.

122. From this ſpecimen it will eaſily be obſerved, that the greateſt part of theſe words rather denote the particular *expreſſion*, or manner of performance, than the *movement*, or quickneſs of time: and indeed it would be to no purpoſe, to attempt to ſeparate theſe two particulars of expreſſion and movement; becauſe the chief uſe of different movements is only to heighten the different expreſſions.

123. There may be pieces of muſic, as there are pictures, which are, ſimply, fine and pretty, without aiming directly at any particular expreſſion; and among this claſs, it is to be feared, too many of our inſtrumental pieces may be juſtly ranked.

To give a better idea of the comparative degrees of movement, denoted by thoſe words which chiefly relate to the time, the following liſt may be of ſervice; where the ſloweſt movement is placed uppermoſt, and the others are gradually quicker, to the bottom.

Adagio, Adagio, very ſlow.
Adagio.
Largo, or *Lento.*
Larghetto.
Andante.
Andantino.

Allegretto, or *Poco Allegro,* or *Vivace.*
Allegro.
Preſto.
Preſtiſſimo, very quick. *

124. The following titles of entire pieces deſerve to be taken notice of, before we finiſh this Chapter.

A *Sonata,* or *Suonata,* is a piece of muſic for inſtruments only. The name is taken from *ſuonare,* to ſound; intimating, that it is a ſucceſſion of ſounds only; in contra-diſtinction to a *Cantata,* which is a piece ſet to words, and therefore to be ſung; from *cantare,* to ſing.

Both theſe titles are, by cuſtom, appropriated to ſuch pieces as are of a conſiderable length, and contain a variety of different movements; the ſhorter pieces are called tunes and ſongs, reſpectively.

A *Motetto* is much the ſame, in church muſic, as a *cantata* in the moral kind. Our *Anthems* generally belong to this claſs.

An *Opera,* literally ſignifies a work, or labor; but is applied, by way of eminence, to muſical entertainments of the dramatic kind. An *opera* is a dramatic poem, ſet to muſic, and exhibited on the ſtage, by ſeveral performers, who perſonate the characters of the drama.

A *Burletta,* is a comic opera. The word ſignifies a burleſque, or jocund performance.

An *Oratorio* is a kind of ſpiritual opera. The muſic is in a ſtile ſuitable for religious purpoſes, and the ſubject taken from ſome part of the Scripture hiſtory.

A *Concerto* is a grand piece of harmony, employing ſeveral inſtruments, and generally of ſeveral different kinds. Among theſe, there ought to be one principal part, to engage the hearers attention more particularly, while the others ſerve only to fill up the harmony. The inſtrument, for which this part is adapted, is diſtinguiſhed by the epithet *concertino;* and the reſt are called *concertanti.* As *Violino concertino,* the firſt or principal violin: *Flauto concertante,* the accompanying flute.

A *Voluntary* is a piece of muſic not reſtricted to any fixed length of ſtrains, or ſimilarity of phraſes, like other regular compoſitions; but is, as it were, an *extempore* flight of the performer's fancy; and is therefore called, by the Italians, *Phantaſia,* a fancy; *Capricio,* a caprice or whim; *Ricercata,* a ſearching, or feeling, for ſomething; *Taſtatura,* an eſſay or trial, *etc.*

A *Serenata,* or ſerenade, is a title given to nocturnal muſic, performed in the open air, near to ſome perſons door or window, whom the performers have a mind to entertain with an unexpected concert.

A *Fugue* is a piece of muſic for ſeveral parts; ſo called from *fuga,* a flight, or running away; becauſe, after one leading part has begun, and proceeded ſome length with a ſtrain, other parts ſucceſſively begin the ſame; and, as it were, fall in behind, and purſue the leading part, which continues to flee before them at a certain diſtance.

The following part ſometimes takes the very ſame pitch wherewith the leading part began; ſometimes an octave below, or above it; and ſometimes a fifth, or fourth below, or above it; and hence ariſe the diſtinctions of *fugue* in the uniſon, in the octave below, or above; or in the fifth, or fourth below, or above.

A *Canon* is a ſelf-returning *fugue;* where each part ſucceſſively re-commences at the beginning, as often as the performers pleaſe; ſo that the parts purſue each other, at ſtated diſtances, in an endleſs round.

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* The celebrated Mr. *Rouſſeau* of Geneva, in the muſical articles of the French *Encyclopedie,* ſays, that the Italians have eſtabliſhed the four words, *adagio, andante, allegro,* and *preſto,* for expreſſing four principal degrees of ſlowneſs and quickneſs in muſic. We have kept cloſe to his explanation in this reſpect, admitting the word *largo,* as a ſpecies of *andante.*

No more but the leading part of theſe pieces is ordinarily wrote, affixing a certain mark, as a double bar, or a pointed .S·, where each of the following parts is to fall in: theſe marks are, properly, the *canoni*, or rules of performance; and hence the name *canon* came to be appropriated to this ſort of compoſitions.

CHAP. VI. *Of* HARMONICAL CONSONANCES.

Article 125. THE nature and effects of harmonical conſonances muſt be, in ſome degree, underſtood, before we can properly proceed to explain the affinity of certain natural ſcales, and the origin of the flat ſeries.

A *Chord* is a combination of various muſical ſounds, heard together. When the ſeveral ſounds mix and unite, in a manner agreeable to the hearer, it is called a *conſonance*, or *conſonant chord;* when they do not unite, but ſeparately diſtract the attention of the ear, it is called a *diſſonance*, or *diſſonant chord.*

126. The moſt perfect conſonances are the octaves, as obſerved, Art. 15. The ſingle octave and its replicates, *viz.* double octave, triple octave, *etc.* have each their peculiarities, which ought not to be overlooked.

When the two terms of the ſingle octave are ſounded, completely true, the upper term unites ſo perfectly with the lower, that the ear is ſenſible of nothing more than the ſound of the lower term, made louder and *fuller*, by the concurrence of the upper term.

The caſe is different with the double octave, or the octave of the octave. Here the upper term will be heard diſtinctly, as well as the lower, and the ear is abundantly ſenſible of two ſounds, but at the ſame time, they are ſo perfectly like to each other, that we can attend to both without any difficulty or diſtraction.

The terms of the triple octave are not ſo eaſy to he compared together, without the interpoſition of ſome other ſound between them. The triple octave is too large an interval to be conceived undivided: and much more the quadruple, and the other ſtill more diſtant replicates of the octave.

127. Along with the double octave, the ſingle octave may be joined, and alſo the fifth above the ſingle octave, and the greater third above the double octave, without cauſing any diſtraction; and theſe five ſounds properly conſtitute what is called the *perfect chord.* The loweſt term is called the *fundamental*, and the others are called *harmonics.*

In order to repreſent the ſounds of this chord, and others which we ſhall have to deſcribe, we ſhall reſume the notation eſtabliſhed in Chap. III. where the ſounds were expreſſed by letters, and three ſeveral octaves diſtinguiſhed by Roman capitals, Roman ſmall, and Italic ſmall, thus

Γ*A*BC*D*EF*G*a*bc*d*ef*g*_a_*_bc_*_d_*_ef_*_g_

Agreeable to this notation, the perfect chord of the fundamental C

is C — — — — c — — g — _c_ — _e_

And that of the fundamental Γ is

Γ — — — — G — — d — g — _b_

The perfect chord of FF is

FF — — — — F — — c — f — _a_

and ſo of others.

128. The intervals of muſical chords are often named by counting them all upward from the loweſt ſound, incluſive; and thus, the fifth, above the ſingle octave, is often called a twelfth; the double octave, a fifteenth; and the greater third above the double octave, a greater ſeventeenth; as will be found by counting upward from the fundamental ſound, in the ſame manner as we formerly did from the key, in chap. I. and II.

It may be uſeful to obſerve, that, in this way of naming Intervals, the ordinal number, which expreſſes any *total* interval, is always *leſs by one* than the ſum of the two numbers which expreſs any two *partial* intervals which together make up the *total*. Thus, in the above Chords, the octave, or eighth, as from C to c, and the fifth from c to g, conſtitute only a twelfth from C to g; but the ſum of 8 and 5 is 13. Again, the double octave is only a fifteenth; but 8 and 8 make 16; the fifteenth and third is only a ſeventeenth; but 15 and 3 make 18; and, to deſcend to ſmaller numbers, a fifth and fourth, or a ſixth and third, or a ſeventh and ſecond, make an octave; two fourths, or a fifth and third, or a ſixth and ſecond, make a ſeventh; a fourth and third, or a fifth and ſecond, make a ſixth; two thirds, or a fourth and ſecond, make a fifth; a third and ſecond, make a fourth; and two ſeconds, make a third. In all theſe inſtances the ſum of the names of the two partial intervals, is one more than the name of the total interval, occaſioned by our including both extremes in the name of every interval, ſo that there is a middle term twice taken in, when we name two contiguous intervals, and only once when we name the two together.

If a total interval be divided into three parts, the number which expreſſes the total will be *leſs by two* than the ſum of the numbers which expreſs the partial intervals; and that becauſe there are two middle terms, each twice taken in, in the names of the partial intervals, and only once in that of the total. Thus C to D is a ſecond, D to F is a third, and F to b is a fourth, and the total C to b is only a ſeventh; whereas 2 and 3 and 4 make 9. The ſame is to be obſerved of all other intervals, when named in this manner.

129. The number of degrees, or ſteps of the ſcale, contained in any interval, is always *leſs by one*, than the name of the interval: thus a ſecond contains only one ſtep; a third contains two ſteps; a fourth, three ſteps; a fifth, four ſteps; a ſixth, five ſteps; a ſeventh, ſix ſteps; and an octave, ſeven ſteps of the ſcale. In this way of conceiving intervals, the ſum of the numbers of ſteps contained in all the partial intervals, is juſt equal to the number of ſteps contained in the total interval, and as the name of the interval *made leſs by one* is always the number of ſteps contained in it; ſo, on the contrary, the number of ſteps *made greater by one* is always the name. For inſtance, an octave contains ſeven ſteps, and a fifth contains four ſteps; therefore the interval of an octave and fifth contains ſeven and four, that is, eleven ſteps, and is called a twelfth. Two octaves contain twice ſeven, that is, fourteen ſteps; and the double octave is called a fifteenth. Two octaves and a third contain fourteen and two, that is, ſixteen ſteps, and the interval is called a ſeventeenth. Two octaves and a fifth contain fourteen and four, that is, eighteen ſteps; and the interval is called a nineteenth. The triple octave contains three times ſeven, or twenty one ſteps, and is called a twenty ſecond, and ſo of all the reſt.

130. Muſicians alſo diſtinguiſh the ſounds of the firſt, ſecond, and third octave above any fundamental, by the epithets *ſingle*, *double*, and *triple* reſpectively, annexed to the degree of the natural ſcale: thus, the G, which is next above C, is called its ſingle fifth; the g, in the ſecond octave above, is a double fifth; and the *g*, in the third octave, is a triple fifth to the fundamental C.

This is the moſt conciſe and intelligible way of expreſſing large intervals, and therefore we ſhall, hereafter, chiefly make uſe of it. The reader is deſired to obſerve, that the word *double* or *triple*, when thus applied to any degree of the ſcale, except the octave, does not mean an interval of a double or triple ſize, but it means a replicate of ſuch a degree in the *ſecond* or *third octave*, above. Thus, a double fifth is not an interval containing two ſingle fifths, as from C to d; for this is properly a ninth, or a double ſecond: and thus, a triple third is not the interval of three contiguous thirds, as from C to b; for this is properly a ſeventh, but it is a replicate of the third, in the third octave above.

According to this way of naming the large intervals, the perfect chord to any fundamental conſiſts of its ſingle octave, double fifth, double octave, and triple greater third.

131. In the formation of this chord to any fundamental, it is to be obſerved that the fifth and greater third muſt always be *perfect*; by which we mean, that they muſt always be ſuch as would take place in the natural ſcale of the fundamental, conſidered as a key note: and, in truth, this perfect chord never takes place, in the harmony of a ſharp ſeries, but either upon the principal key, or upon a note which can be conſidered as an *occaſional*, or new key for the time, *viz.* the fifth or fourth of the ſcale, as was hinted in the firſt note to Art. 31. In the harmony of a flat ſeries its uſe is only *accidental*, as will be ſhewn hereafter.

If the learner have well digeſted the formation of the ſeveral natural ſcales, as explained Chap. III. he will be able readily to determine the perfect chord of any note in the ſyſtem, by conſidering that note as a key, and applying the ſame fifth and third, which naturally belong to it as ſuch. For inſtance, in the chords of C, Γ, and F F, repreſented above, Art. 127. the ſounds are the ſame which exiſt as thirds and fifths in the ſcales of theſe fundamentals, according to the ſcheme, Art. 48: and, by the ſame rule, the fundamental D, will take a, for its double fifth, and *f*※ for its triple third; according to the third ſcale, Art. 48: and the fundamental E, will take b, for its double fifth, and *g*※ for its triple third, according to the fifth ſcale of the ſame ſcheme.

132. This chord is very eaſily produced, in its full form, upon an organ, or any other key'd inſtrument, and if all the ſounds be perfectly right tuned, and ſtruck juſt at the ſame inſtant, a hearer can ſcarcely imagine the whole chord to be any more than one ſingle ſound, of a remarkably full and *bold* kind. If the ſeveral ſounds be introduced one after another, beginning with the loweſt, or fundamental, and proceeding upward, one may plainly perceive every ſucceſſive ſound, as it were, *entering* and *uniting* with the fundamental; which ſeems only to grow fuller and *bolder*, by every addition. This experiment is no leſs inſtructive than entertaining.

133. The ſounds of this perfect chord may be arranged in ſeveral other different ways, or ſome of them may be left out, and yet ſtill the ſame effect produced, but in a more imperfect manner: for there is no other way in which the ſounds can be arranged, to produce ſo complete and ſo perfect a conſonance as that already deſcribed.

The leaving out of ſome of the ſounds, belonging to a chord, is called *omiſſion*, or *retrenchment*; and the placing one of the harmonics in the baſs, inſtead of the fundamental is called *inverſion* of a chord.

134. As the full perfect chord conſiſts of five ſounds, it is plain that when fewer than five parts are ſet together, ſome omiſſions become neceſſary: and, in order to avoid diſtant leaps, and to give each part a more gradual and eaſy ſucceſſion, as well as to give a greater variety to the harmony, ſeveral different arrangements and inverſions of the ſame chord are not only allowable, but are alſo preferable to a conſecution of chords all equally full and perfect.

135. In regard to the different arrangements, which we may call *diſlocations*; it is always eſteemed a ſpecies of the perfect

chord of any note, if its perfect third, fifth, and octave be joined with it, in any poſition; whether any or all of theſe three be taken in the ſingle, or double, or triple octave above the fundamental, and which ſoever of them be uppermoſt: but, in general, the further we depart from the diſpoſition of the moſt perfect of this or any other kind of chord, the greater imperfection is thereby introduced. In every poſition where the fundamental note is in the baſs, the chord is denominated *erect*.

136. In regard to *omiſſions*, we have to obſerve, that not only one or two of the notes of this chord may be wanting, but they may all be wanting except one, and yet ſtill the ſame idea conceived by the hearer, as if they were all joined together; eſpecially if the hearer be accuſtomed to harmony, and have contracted a kind of acquaintance with the proper ſucceſſions of chords of which it conſiſts; for, daily experience teſtifies, that by an acquired familiarity with the ſucceſſions of harmony, a ſkilful perſon becomes able to ſupply the proper *accompanyments* in imagination, when only one part is heard, if the paſſages be not very uncommon or unnatural.

137. There is ſomething in the very nature of muſical ſounds which contributes ſome aſſiſtance to the imagination in this matter. Every muſical ſound which we call ſingle, becauſe produced by one ſtring, or one pipe, or one bell, *&c.* is, really and intrinſically, a kind of chord, or combination of ſeveral ſounds, uniting under the idea of one fundamental, by which we eſtimate the tone or pitch of the whole.

Theſe combinations are very remarkable in the ſounds of large *bells*, eſpecially for a little time immediately after the ſtroke is given, and if the hearer be near the bell. The ſound is at firſt a perfect confuſion of tones, and whatever particular tone we have previouſly eſtimated and ſet our attention upon, we are almoſt ſure to find ſomething like it among the conſonances of a bell; and if it do not occur to us after the firſt ſtroke, it may poſſibly be found after a ſecond or third; for it may be obſerved, that not only different bells have their ſounds differently compounded, but alſo the ſame bell, when ſtruck ſeveral times, often yields ſeveral different combinations of tones, although the ſame fundamental ſtill prevails.

If a ſounding body of any kind be ſuſpended in a ſtring, and the ſtring applied to our ear, with one hand, and the body ſtruck upon with the other hand, we can perceive not only a remarkably loud ſound, but alſo a very ſurprizing combination of various tones in a ſmall rod of iron, or a piece of thick wire, in a flat piece of braſs, or other metal, and in numberleſs things, which, if ſtruck upon, without ſome ſuch device, would yield no diſtinguiſhable tone at all. Experiments of this kind lie in every one's power, without any troubleſome apparatus. All we would infer from ſuch trials, at preſent, is, that although the harmonics, belonging to the perfect chord of any ſound, be generally, if not univerſally, predominant among its *natural conſonances*, when examined in this manner, yet there are not wanting other ſounds to coincide with, and aſſiſt our imagination, in caſe we have occaſion to regard the total ſound, not as a fundamental, but as one of the harmonics of ſome other fundamental. Thus when we attend to the third of a natural ſcale, and conſider it as an harmonic to the key as fundamental, we either find ſomething to induce us to join, or at leaſt we find nothing to hinder us from joining, along with it, its leſs third above, and its ſixth, inſtead of a greater third, and fifth: ſo that when E occurs in the key of C, we naturally join it, or imagine it to be joined, with G and c, rather than G ※ and b, which laſt are its perfect chord. If we have begun with the key of C, the rememberance of that key, and the ſcale dependent upon it, will not ſuffer us to uſe any ſound *remarkably* different from thoſe which exiſt in that ſcale, ſo that we cannot admit G ※ without relinquiſhing, in ſome meaſure, the key of C; and rather than do this, we chuſe to give E a chord, borrowed from the perfect chord of C, by inverſion. In the ſame manner we ſometimes, in the key of C, give G, which is the fifth, a chord borrowed from the perfect chord of C by inverſion; but G can take its own perfect chord, without employing any note foreign to the key of C, and the ſame may be ſaid of F, as appears in the ſcheme, Art. 127.

138. The chords borrowed from the perfect, by inverſion, when the third or fifth is placed in the baſs, are called *inverted chords*, and have their intervals alſo counted from the baſs-note: and hence ariſes the chord of the ſixth and third, called ſimply the ſixth; and the chord of the ſixth and fourth: the former of theſe exiſting upon the third, and the latter upon the fifth of the fundamental as baſs.

Thus, from the perfect chord of C, *viz.* C—E—G——c
which we count 1—3—5——8
ariſes the Chord of the ſixth on E, *viz.* E—G——c
which we count 1—3——6
and that of ſixth and fourth on G, *viz.* G——c—e
which we count 1——4—6

Theſe inverted chords are juſtly eſteemed imperfect repreſentations of the fundamental chord, but ſtill they are repreſentations of it. The chord of the ſixth is beſt when the ſounds are neareſt to each other, in the ſame order as they ſtand above; but they may be farther diſtant. That of the ſixth and fourth is better, when the fourth ſound, which repreſents the fundamental, is carried an octave higher, and ſo made a double fourth to the baſs note.

It is obſervable, that in all poſitions of this perfect chord, whether *erect* or *inverted*, the note which makes the third, attracts our attention, more than that which makes the fifth to the fundamental ſound.

139. There is another ſpecies of chord which takes a leſs third inſtead of a greater, and is alſo denominated perfect, becauſe it may be ſo introduced, and ſo circumſtanced, as to leave nothing for the hearer to expect after it.

This is called the *flat perfect chord*, and gives riſe to the flat ſeries. We ſhall, for brevity's ſake, uſe the freedom to denote this chord by the characters ♭P, and the other by the character P. ſimply, or rather ※P. to prevent miſtakes.

The ♭P chord takes place upon the ſixth, or ſecond, or third of the natural ſcale, without cauſing any remarkable alterations: for theſe three have a leſs third, and a perfect fifth among the ſounds of the ſcale.

140. It may be obſerved of the ♭P chord, that it is more perfect when the third to the fundamental is covered by ſome higher ſound; if the third be placed in the baſs, by inverſion, it is ſtill equally good: but yet, in every poſition, the leſs third, in ſo far as we attend to it, cauſes a kind of diſtraction, and is an abatement to the perfection of the chord; ſo that the trueſt perfection of this chord, is to omit the leſs third altogether, and take in only the fundamental, and its octaves and fifth.

Thus, the ♭P chord of A may be
A ——— ——— ——— a — c — e —— *a*
or it may be C ——— ——— a — — e —— *a*
or beſt of all, A ——— ——— ——— a — — e —— *a*

The order of this ♭P chord may be varied ſeveral other ways, and diſlocations, omiſſions, and inverſions practiſed much the ſame as with the ※P chord, and yet ſtill the ſame effect produced, in ſome degree.

141. There is an eſſential difference between the ※P and the ♭P chords, in all poſitions. The ※P chord, and all its derivatives are bold and commanding, the ♭P, and its derivatives are dejected and plaintive. The greater third of the ※P is a ſound which attracts our attention, but the leſs third of the ♭P

is a kind of diſregarded, or *loſt ſound* in all ſituations; and our attention is rather turned upon the fifth in its ſtead. Further, the third of the ♯P chord is a ſupplicative tone; but the third of the ♭P chord is *heavy* and *ſpiritleſs*.

142. In either kind of perfect chord, the ſounds unite better, and the effect is more ſatisfactory and concluſive, when the fundamental is rather *ſtronger*, or *more diſtinguiſhable* than the others: and the unity of the whole is deſtroyed, when the third or fifth attracts too much of our attention.

The joining of the octaves to any ſound renders it *ſtronger*, and therefore the perfect chord is beſt when the upper octaves of the fundamental ſound are heard along with it, as repreſented, Art. 127, and 140. But the joining octaves with the third or fifth, which the muſicians call *doubling* of theſe notes, is an abatement to the perfection of a chord.

The reaſon is this. It is one neceſſary property of a ſatisfactory and concluſive chord, that the third and fifth be conceived, only, as proceeding from, and ſerving to *fortify the natural conſonances* of the fundamental; and therefore they ought not to be ſo ſtrong, or ſo diſtinguiſhable as the fundamental. The artiſts ſay, very juſtly, that the doubling of the third or fifth takes off their dependence upon the fundamental.

Of the two, it is commonly better to double the fifth than the third of a perfect chord; becauſe the fifth has a more near relation to, and is more prevalent among the natural conſonances of the fundamental: the third of a ♭P chord, eſpecially, cannot be doubled without diſtracting the hearer's attention from the fundamental, and fixing it too much on the ſame third; which, as we have ſaid above, ought to be a diſregarded, *loſt ſound*.

When we ſpeak thus of doubling ſounds, it ought to be underſtood only in reſpect to ſounds of equal ſtrength, or nearly ſo; for, as to ſounds much weaker, they paſs unregarded; and it is the ſame thing in effect whether they be there or not. Thus, a few womens voices may join with the tenor of a church tune in the octave above, by which every note of the tenor will be doubled in reality, and yet, if the mens voices be conſiderably ſtronger, the harmony is not ſenſibly hurt: and thus, in the compound ſtops of an organ or harpſicord, every note of a full chord is accompanied by its upper octave, and frequently others of the harmonics of its own perfect chord, and yet, theſe being in due ſubordination as to ſtrength, do not at all confuſe or diſtract the hearer.

143. Although the doubling of the harmonics of a chord, as above, partly ſubverts the natural order of the conſonance, yet that does not hinder ſuch chords from taking place, and being of the greateſt uſe in harmony, but then they are to be admitted as *medial*, and not as *final* or concluſive chords; becauſe there is always an expectation of ſomething more ſatisfactory to follow; and it is as neceſſary to keep up the expectation of the ear in the middle of a piece, as to put an end to it at the concluſion.

What is here ſaid of the ſounds of a chord, made *ſtronger* by being doubled, is equally true in regard to ſounds, when louder than the reſt, though not doubled: ſo that the ear is not ſatisfied if the third or fifth of a chord be *louder* than the fundamental.

144. Some ſounds of a chord are *more diſtinguiſhable* than others, by their *ſituation*. Thus our attention is carried either to the loweſt or the higheſt ſound which exiſts in a chord, rather than any of thoſe which lie, as it were, concealed in the middle. We expect to find the fundamental loweſt, and the harmonics, as hinted above, fortifying the natural conſonances of the fundamental: but when this is not the caſe, as in inverted chords, it is beſt to have the octave of the fundamental higheſt, that the hearer, being diſappointed of it below, may yet find it

above; and it is for this reaſon, with the concurrent teſtimony of experience, that we pronounce the inverted chords better, as deſcribed, Art. 138.

Hence alſo it is expreſsly forbidden to place the octave to the baſs note of an inverted chord uppermoſt; except in paſſages where it would be no detriment to the harmony to conſider that baſs as being itſelf a fundamental.

All inverted chords may juſtly be eſteemed *medial;* for howſoever our attention may be carried to this or the other upper ſound, through the courſe of a tune, it is ſure to fall upon the baſs at the end. See Art. 61. If ſome pieces of muſic end with the chord of the ſixth upon the third of the key as baſs, it is a *licence,* allowed in adapting muſic to certain imperfect inſtruments; ſuch as the Trumpet and French horn; and is tolerated only through cuſtom; but is unſatisfactory to all who are not accuſtomed with it.

145. Some ſounds are alſo rendered *more diſtinguiſhable* by the *ſucceſſion* in which they occur: but this muſt be poſtponed till we come to conſider chords in ſucceſſion. We ſpeak, at preſent, only of chords, ſingly conſidered.

In Exam. XXXIII. Plate III. the chord of G is drawn out upon the treble and baſs ſtaves, in ſeveral different arrangements, for the convenience of ſuch as have practiced upon a key'd inſtrument, and of conſequence can more readily ſtrike the chords, when repreſented in this manner, than by the letters as above. This chord of G may ſerve as a ſpecimen of all the ※P ſort; Exam. XXXIV. repreſents ſeveral arrangements of the chord of A, in the ſame manner, as a ſpecimen of all the ♭P ſort. Theſe chords are diſtinguiſhed into *final* and *medial*, agreeable to the preceding obſervations. Many more of each claſs might be added, but theſe may ſerve to evidence both the truth and the importance of ſuch obſervations; which, till of late, have been too much neglected, even by the moſt ſkilful writers on this ſubject.

146. ANNOTATIONS to Exam. XXXIII. and XXXIV.

Theſe examples are divided into bars, marked with the letters H. I. K. L. M. for the ſake of references.

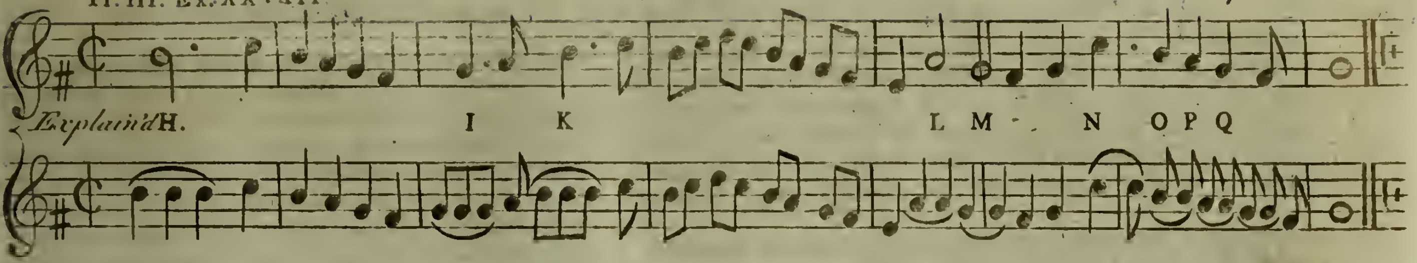
The firſt chord of G, in the firſt bar H, is the ſame with thoſe deſcribed Art. 127.; conſiſting of the fundamental, and its ſingle octave, double fifth, double octave, and triple greater third. In the ſecond chord, the ſingle octave of the fundamental is omitted. In the third chord, the fifth is alſo omitted: and the fourth and laſt chord, in this bar, wants the fifth, and both the octaves of the fundamental; and the greater third only remains joined with the fundamental ſound.

If theſe four chords be ſtruck ſucceſſively, in the order they ſtand, a hearer will plainly perceive a deficiency in the fulneſs of each ſucceeding chord, compared with that which went before it: there is a kind of breach occaſioned by the omiſſion of the intermediate notes of the chord, which renders the defective chords unſatisfactory to the ear, while we retain the impreſſion of a more full and complete chord, which we have juſt before heard; but yet ſuch defective chords are abundantly ſatisfactory and concluſive, when introduced after others which are equally defective. A full chord is neceſſary to conclude a full harmony; but a defective chord ought to conclude a defective and incomplete harmony.

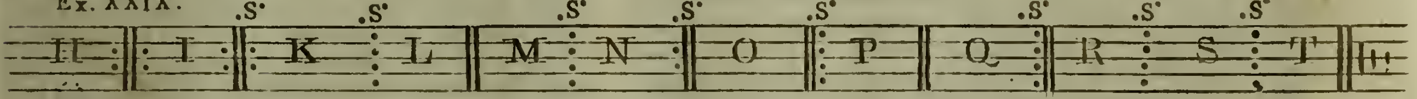
The chords of A, in the bar H, differ from thoſe above in the diſpoſition of the ſounds; for, in theſe, the fifth takes the uppermoſt place, whereas the third is higheſt in thoſe; and in the omiſſions the third is here caſt out, and the fifth retained to the laſt; whereas there the fifth is caſt out, and the third retained: and in truth, if any reſemblance be found between the effects of the different ſounds of a ※P, and thoſe of a ♭P chord, we muſt compare the third of a ※P chord with the fifth of a ♭P; and the fifth of a ※P chord with the third of a ♭P; as will appear upon a careful examination and trial of theſe examples.

The bar I differs from the former, in both examples, only in

Pl. III. Ex. XXVIII.

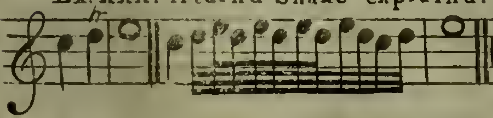


Ex. XXIX.

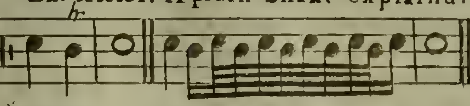


Order of the Parts. H. H. I. I. K. K. L. M. N. N. O. P. Q. P. Q. R. S. S. T.

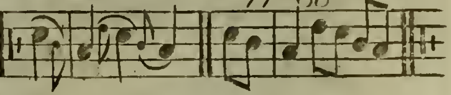
Ex. XXX. A turn'd Shake explain'd.



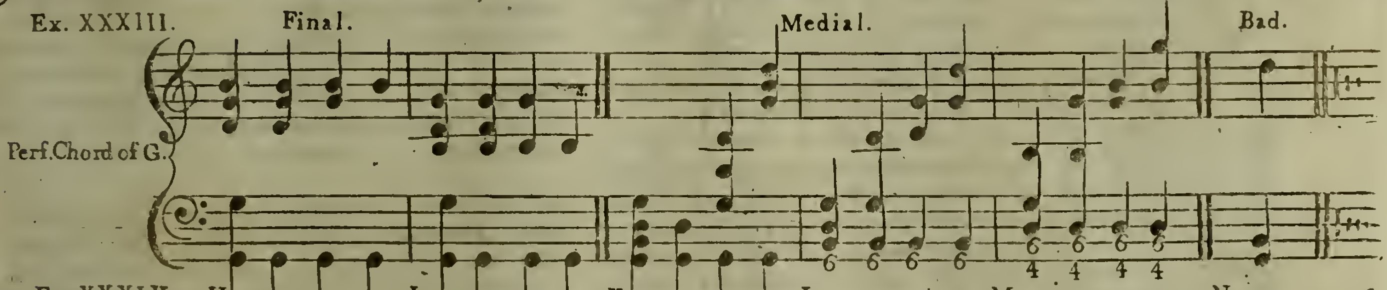
Ex. XXXI. A plain Shake explain'd.



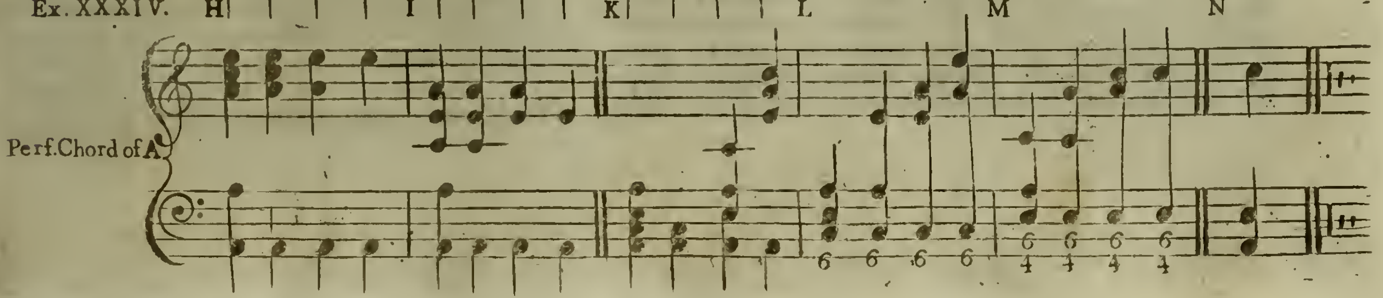
Ex. XXXII. *Appoggiatura.*

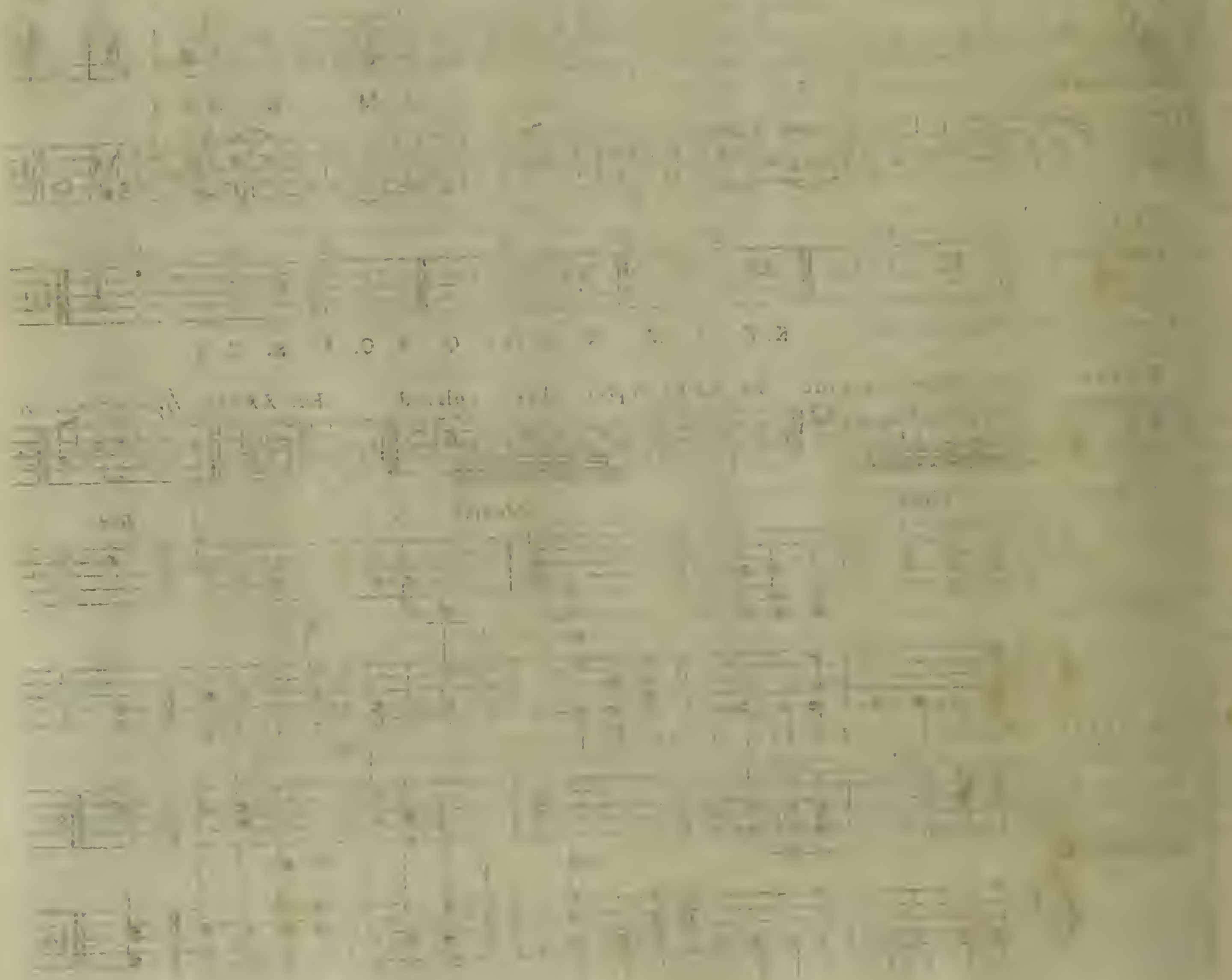


Ex. XXXIII.



Ex. XXXIV.





the order of the ſounds, the harmonics being depreſſed below the double octave of the fundamental.

The chords in the bar K, in both examples, may be juſtly eſteemed *medial*, on account of their imperfection, although they are *erect*: the firſt of theſe is the whole chord brought down into the firſt octave above the fundamental, and in this ſituation the harmonics are too far depreſſed below their natural places. See Art. 135. The ſecond chords of this bar K have only one, and that the more allowable one, of the harmonics, in this depreſſed ſituation: for it may be obſerved, that the note which moſt naturally ſtands uppermoſt can leaſt be allowed to be placed next the fundamental; and therefore the fifth of a ※P chord is more tolerable, in this ſituation, than the third would be; and the third of a ♭P is more tolerable than the fifth.

The third and fourth chords of the bar K, have the fifth of the ※P, and the third of the ♭P uppermoſt; which circumſtance alone is enough to prevent them from being ſatisfactory. We ſhall ſhew the reaſon hereafter.

The bar L conſiſts of chords of the ſixth, and the bar M of ſixth and fourths by inverſion. In all the different poſitions of theſe chords, it may be obſerved, that the doubling of the baſs note is avoided. See Art. 144.

At N is repreſented a *bad chord*, being as much as poſſible the reverſe of every thing which makes a chord *good*: and thus much may ſerve for the learners examination and amuſement at preſent.

We have begun the article of *conſonances* with this ſhort ſurvey of the perfect chords, becauſe it is neceſſary to conceive, not only the compound ſounds of harmony, but alſo every ſingle ſound in melody, as belonging to ſome perfect chord, in order to account for their various effects, and the preference due to ſome ſucceſſions of ſounds rather than others: as will be better ſeen hereafter.

147. It is neceſſary to obſerve, in the mean time, that the natural ſcale of any note affords ſix different chords, three of them being ※P, *viz.* thoſe of the key, the fifth, and the fourth; and the other three being ♭P, *viz.* thoſe of the ſixth, and the ſecond, and the third: or, in other words, we have ſix notes in the natural ſcale, any of which may be conſtituted the fundamental of a perfect chord, without relinquiſhing the principal key.

To avoid ambiguity in ſpeaking of theſe chords, we ſhall diſtinguiſh the fundamental note of any chord by the letter *f* annexed to it. The neceſſity of ſome diſtinction of this kind will appear, becauſe, as we have already ſeen, Art. 138. there is a chord called *the chord of the ſixth*, ariſing from the perfect by inverſion, which is quite different from the perfect chord of the *ſixth, as fundamental*: and the ſame ambiguity would happen in the names of other chords, not yet ſpoke of, unleſs the fundamental ſound be ſome way diſtinguiſhed.

See now the following ſcheme of the perfect chords in the natural ſcale.

The ※P	Of the key *f.* contains the	K—3d—5.
	Of the 5th *f.* contains the	5th—7th—2d.
	Of the 4th *f.* contains the	4th—6th—K.
The ♭P	Of the 6th *f.* contains the	6th—K—3d.
	Of the 2d *f.* contains the	2d—4th—6th.
	Of the 3d *f.* contains the	3d—5th—7th.

We ſay theſe chords *contain* theſe notes, reſpectively, by which we would be underſtood to mean, that theſe notes, not only in the order they ſtand here, but in any order, either *erect* or *inverted*, ſtill conſtitute the ſame chord, though in different degrees of perfection, as ſhewn above.

148. The ſeventh of the ſcale is the only note which cannot have a perfect chord applied to it, becauſe it has not a perfect fifth in the ſcale: for it may be remarked, that the perfect fifth always contains four ſteps of the ſcale, three of which ſteps are tones, and one a ſemitone; but above the ſeventh we have firſt

a ſemitone, then two tones, and then another ſemitone, which brings us to a fifth, which is only two tones, and two ſemitones above the ſeventh; and this is called a *falſe fifth*, being a ſemitone leſs than the perfect fifth, and is a *diſſonance*.

The ſame concluſion follows from obſerving, that the perfect fifth always contains a greater third and a leſs third, and that the greater third is ſituated below in the ※P chord, and the leſs third is below in the ♭P chord, which makes the difference between the two ſorts of perfect chords; but that above the ſeventh we have two leſs thirds contiguous to each other, *viz.* from the ſeventh to the ſecond, and from the ſecond to the fourth; ſo that unleſs either the ſeventh be flattened, or the fourth ſharpened, the interval between theſe two will be a *falſe fifth*. Now, by flattening the ſeventh, we make it capable to be the fundamental of a ※P chord; and by ſharpening the fourth, we make the ſeventh ſuſceptible of a ♭P chord: but then either of theſe alterations cauſes a change of the key, as was obſerved, Art. 50.; ſo that, without relinquiſhing the key, we cannot give the ſeventh a perfect chord, that is, the ſeventh cannot be a fundamental note.

149. From the above ſcheme it appears, that any note of the ſcale may occaſionally belong to two or three different perfect chords. For inſtance, the key may belong to three chords; for, it may be the fundamental of its own perfect chord, or it may be a third in the chord of the ſixth *f*, or a fifth in that of the fourth *f*. Again, the ſecond may belong to two chords; for, it may be the fundamental of its own chord, or a fifth in the chord of the fifth *f*: and thus every note may belong to two perfect chords at leaſt, one of which is always ※P, and another ♭P. If the ſeventh had been ſuſceptible of a chord, like the other notes of the ſcale, then every note would have belonged to three perfect chords; *viz.* each note would have been the fundamental of one chord, the third of another, and the fifth of another; but becauſe the ſeventh cannot have a perfect chord, therefore the ſeventh, and ſecond, and fourth, belong only to two perfect chords each; while the key, the third, the fifth, and the ſixth belong to three.

150. It appears then, that when any note of the ſcale is ſounded, we have the choice of two or three chords to which we may refer it; and becauſe one of theſe chords is always ※P, and another ♭P, we have therefore two ſorts of harmony, called *ſharp* and *flat* harmony; in the former of which, the ※P chords are more frequent, and in the latter, the ♭P. If we have begun with conceiving the key note, as bearing a ※P chord, which is the caſe with the natural ſcale, deſcribed Ch. I. and II. we chuſe to refer all the following notes to ſome ※P chord, as often as we can do it, conſiſtent with other rules which we ſhall ſpeak of in due courſe; and if we have begun with a key note, bearing a ♭P chord, the ſame preference is due to the ♭P chords, ſo long as we retain that key note. This may ſerve at preſent to give ſome idea of the two different ſorts of harmony; which we ſhall examine more minutely, after diſpatching what is farther neceſſary to be previouſly obſerved in regard to conſonances.

151. Within theſe laſt fifty years, the greateſt writers on muſic have very aſſiduouſly purſued theſe enquiries concerning the nature and propriety of *fundamental ſucceſſions;* which they occaſionally exhibit in an additional ſtaff of lines, placed below the others, and called a *fundamental baſs*, This baſs is not intended to be performed along with the other parts, for the reaſons given, Art. 134.; but inſtead thereof, another baſs is ſubſtituted, conſiſting of fundamentals and harmonics intermixed, which is called the *continued* or *thorough-baſs*. The uſe of the fundamental baſs, when ſubjoined, is only to ſhew from whence every conſonance is derived, and to what note each of the ſounds ought to be refered.

The fundamental baſs is never ſubjoined to a piece of muſic, except in examples deſigned for beginners, but inſtead of it there are figures, and other marks put above or below certain notes of the thorough-baſs, to denote the ſpecies of every *borrowed chord* which occurs, and this is called a *figured thorough-baſs*.

152. When the thorough-baſs takes the third of a perfect chord, we have already ſeen, Art. 138. that the upper parts then become ſixth and third to this baſs, and it is called a chord of the ſixth; and when the thorough-baſs takes the fifth of a perfect chord, the upper parts become ſixth and fourth to this baſs, and it is called a chord of the ſixth and fourth.

The exiſtence of a chord of the ſixth is known by the figure 6. and that of ſixth and fourth, by the figures 6 and 4. over or under the baſs note. See the bars L and M of Ex. XXXIII. and XXXIV. When the thorough-baſs coincides with the fundamental, in a perfect chord, there is no occaſion for any figures. The accompanyment of the third, fifth, and octave, belonging to a fundamental, is ſuppoſed to take place, either with or without any of theſe figures, 3, 5, 8. annexed to the note *.

This is all that relates to the figuring of the perfect chords in the ſcale, and their derivatives; and it is very eaſy to remember, becauſe the inverted chords are figured juſt as they are named. The manner of figuring other chords will be explained, when theſe come under conſideration.

The reader ought to be advertiſed, that the method of figuring a thorough-baſs is not ſo completely ſettled among muſicians, but that different maſters denote the ſame chord in different manners. We ſhall endeavour, in the courſe of this work, to explain the method uſed by *Signior Paſquali*, in his *Thorough-baſs made eaſy*, being the ſame which is moſt generally received in Britain; and at the ſame time add, in the ſubjoined notes, ſuch remarks concerning the figuring of foreign maſters, as ſeem pertinent and uſeful.

153. Two ſounds are ſaid to be *concord between themſelves*, when both of them can be refered to one and the ſame fundamental perfect chord; and two ſounds are called *diſcord*, when they cannot both be refered to one perfect chord.

This is the moſt ſimple, and, at the ſame time, the moſt ſatisfactory definition we can give of *concord* and *diſcord*: for, allowing that the mind *naturally chuſes* to conceive every ſound in muſic as belonging to ſome perfect chord, it is plain, that two ſounds will *ſeem to unite*, when both of them are included in the idea of one perfect chord; and that they will not unite, but ſeparately *diſtract our attention*, when this cannot be done, or when they muſt neceſſarily be refered to two different fundamentals.

Nevertheleſs, *diſcords*, when judiciouſly choſen, and properly inſerted, are of great uſe in harmony, and produce the moſt agreeable effects †. We can frequently admit of, and receive a particular pleaſure from the intermixture of two fundamental perfect chords, if ſuch *diſſonant* or *double meaning* chords be properly preceded and followed by others; or, in the muſician's language, if the diſcords be properly *prepared* and *reſolved*, of which more hereafter.

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* Though the third and fifth be implied, when no figures are annexed to a thorough-baſs note, yet there are caſes in which it is neceſſary to figure the perfect chord as well as any other. For inſtance, when the ſame note occurs ſeveral times over in the baſs, and having firſt born ſome other chord, comes afterwards to bear a perfect chord: in this caſe it is neceſſary to denote the enterance of the perfect chord by one or more of theſe figures, 8. 5. 3. becauſe otherwiſe the former chord would appear to be continued; for it is a rule, when any note is ſeveral times repeated, that, in playing thorough-baſs, the chord of the firſt note is to be continued upon all the reſt, unleſs contradicted by other figures.

It is alſo proper to figure the perfect chord, in ſome paſſages, where it is introduced out of the ordinary courſe, and, of conſequence, partly unexpected; becauſe the performer, ſeeing no figures to direct him, might follow the ordinary courſe, and ſo run contrary to the deſign of the compoſer.

As it is ſometimes neceſſary to figure the perfect chord, it is alſo ſometimes convenient to figure the chord of the ſixth with 8 and 6, or with 6 and 3, rather than 6 ſimply; and this often happens, when a former chord is to be contradicted upon the repetition of the ſame note, as will be better underſtood hereafter. In the ſame manner, and for the ſame reaſon, the figure 8 is ſometimes added to the 6 and 4, which uſually denote the chord of the ſixth and fourth.

It is evident, that the occaſional addition of theſe figures creates no difficulty, becauſe, whether they be there or not, the ſounds which they repreſent, are always implied in the ſtructure of the chord, as ſhewn, Art. 138.

154. According to the above definition of concord, it will eaſily appear, that all the thirds which exiſt in the ſcale, whether they be greater or leſs; and, by inverſion, all the ſixths in the ſcale are concords: as alſo all the fifths in the ſcale are concords, except the *falſe fifth*, which lies in aſcending, between the 7th and the 4h; and, by inverſion, all the fourths are concords, except the *tritone*, ſee Art. 11. which is the inverſion of the falſe fifth, and lies in aſcending between the 4th and the 7th.

155. It is alſo evident, that both the terms of every perfect fifth muſt be refered to the lower term as fundamental, and of conſequence both the terms of every perfect fourth muſt be refered to the upper term as fundamental: but in regard to thirds and ſixths, ſometimes the lower term of a third, or the upper term of a ſixth, is to be eſteemed the fundamental; and ſometimes another ſound, which is a third below theſe terms, muſt be pitched upon, and oftentimes it is in our option to chuſe either of theſe for a fundamental; but neither the upper term of a fifth, or a third, nor the lower term of a fourth, or a ſixth, can be eſteemed the fundamental, becauſe, in theſe caſes, the other term will not belong to the chord.

A few examples will make this ſufficiently plain. When the K and the 5th ſtand together they conſtitute a perfect fifth when erect, and a perfect fourth, when inverted, and in either poſition theſe two muſt be refered to the K*f*. and no other, becauſe no other chord contains both theſe notes. For the ſame reaſon the 2d and 6th muſt be refered to the 2*f*, and the 3d and 7th to the 3*f*: and ſo of all other perfect fifths and fourths.

When the K and the 3d ſtand together, they conſtitute a greater third, when erect, and a leſs ſixth, when inverted; and theſe two may be conceived as belonging to the chord of the K*f*, or to that of the 6*f*; for either of theſe chords contains both thoſe notes: ſo that here it is in our option to chuſe either the lower term of the third, *viz.* the K, or the note which is another third below this term, *viz.* the 6th, for a fundamental; and the preference muſt be given to one or the other of theſe, in compliance with other rules and reſtrictions, to be treated of hereafter.

Again, when the 2d and 4th ſtand together they conſtitute a leſs third, when erect; and a greater ſixth, inverted; and theſe two muſt be refered to the 2*f*, and no other, becauſe were we to ſeek a fundamental, another third below this lower term, we ſhould fall upon the 7th, which, as ſhewn Art. 148. cannot be admitted as ſuch.

On the contrary, when the 7th and 2d ſtand together as a leſs third, we are obliged to deſcend a third below the lower term, which brings us to the 5*f*. becauſe here the lower term itſelf is the 7th.

From theſe inſtances it will eaſily appear, that the avoiding of the 7th of the ſcale in the fundamental baſs, is the ſole cauſe of all theſe varieties in the choice of fundamentals.

Thus much may ſuffice, at preſent, in regard to *conſonances.* We muſt crave the reader's farther patience and attention to a few remarks concerning *diſſonances*, which are neceſſary before we can properly proceed to the application; but ſhall be as conciſe as poſſible.

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† The definition commonly given of *diſcord* in general, *viz.* that it is *the effect of two ſounds, whoſe union diſpleaſes, or is diſagreeable to the ear*, is not proper; becauſe, though all diſcords diſtract our attention, yet they do not all diſpleaſe us, but, on the contrary, ſome diſcords are much more pleaſing and agreeable, in certain ſituations, than concords would be. It ſeems neceſſary to make a farther diſtinction between what only *divides our attention*, and what *diſpleaſes.* The former of theſe is properly a *diſcord* in muſic, and the latter a *falſe or inharmonical relation.*

CHAP. VII. *Of* DISSONANCES.

Art. 156. AS the falſe fifth and the tritone are diſcordant intervals; ſo alſo are all intervals of a ſeventh, or a ſecond: the reaſon is plain from the premiſed principles, becauſe two notes, including either of theſe intervals, cannot both belong to one perfect chord.

157. Seconds and ſevenths are diſtinguiſhed, like thirds and ſixths, into greater and leſs. The whole tone is called a greater ſecond, and the ſemitone a leſs ſecond; the ſeventh, which is a ſemitone leſs than an octave, is called a greater ſeventh; and that which is a tone leſs than an octave, a leſs ſeventh.

The greater ſeventh, and leſs ſecond, may either of them be conceived as an inverſion of the other; in the ſame manner the leſs ſeventh, and greater ſecond, are derived one from the other by inverſion. So that we need only to conſider the ſeconds in particular, as whatever properties belong to them, may, for the moſt part, be equally attributed to the ſevenths, only changing the epithet *greater* for *leſs*, and *vice verſa*.

158. The leſs ſecond, or ſemitone, is a much more harſh and impracticable diſcord than the greater ſecond, or whole tone. The former of theſe can only be admitted ſeldom, and with great caution; but the latter is very often introduced. Thus the 7th and K, or the 3d and 4th of the natural ſcale, are ſeldom joined in harmony; theſe being intervals of a ſemitone only: but the K and 2d, or the 2d and 3d, or the 4th and 5th, or the 5th and 6th, or the 6th and 7th of the natural ſcale, are often ſet together; theſe being all intervals of a whole tone.

159. A diſſonant chord may be produced either by adding another ſound to a perfect chord, or by omitting one of the proper harmonics of a perfect chord, and ſubſtituting another note in its ſtead. The former of theſe is more commonly practiſed, and therefore deſerves to be firſt conſidered.

Every erect perfect chord conſiſts of two contiguous thirds, ſituated next above the fundamental, and a perfect fourth above theſe, which brings us to the octave of the fundamental. Now, it is plain, that the addition of another ſound, to ſuch a chord, can be beſt allowed within the limits of the fourth, in ſuch manner that this fourth may be divided by the added ſound into a leſs third and a whole tone; becauſe, by this means, the diſcords created among the mutual relations are the feweſt and moſt tolerable; and the degree of harſhneſs, in every diſſonant chord, may juſtly be eſtimated by the number and quality of the diſcords which exiſt together.

160. Hence it follows, that the *added ſound*, in a diſſonant chord, is generally either the leſs ſeventh, or the greater ſixth, above the governing fundamental; that is, above the ſound which would be the ſole fundamental, if the diſcord were not heard; for, it muſt be obſerved, that no one ſound can properly be called the *ſole* fundamental of a diſſonant chord, becauſe of the divided attention which the diſcord creates; but notwithſtanding we muſt be ſuppoſed to have two fundamentals partly in view, yet one of them may, for various reaſons, claim the greater ſhare of our regard; and therefore may be properly called *governing*, or predominant.

161. All fundamentals are ſuſceptible either of a leſs ſeventh or a greater ſixth, according as the ſeventh above is a leſs ſeventh, or the ſixth above is a greater ſixth in the natural ſcale to which they belong. Thus the chords of the K*f*, and the

4*f*, can have a ſixth added, but not a ſeventh, becauſe they have a greater ſixth, but not a leſs ſeventh in the ſcale. On the contrary, the chords of the 3*f*, and the 6*f*, can have a ſeventh added, but not a ſixth, becauſe they have a leſs ſeventh, but not a greater ſixth in the ſcale. The chords of the 2*f*, and the 5*f*, may have either a ſixth or a ſeventh added, becauſe they have both a greater ſixth and a leſs ſeventh in the ſcale. All this may be ſuppoſed obvious to the reader, being drawn entirely from the ſituation of the tones and ſemitones in the natural ſcale. It is plain, that if the added diſcord muſt divide the interval of the fourth, which exiſts between the fifth of any fundamental and its octave, into a whole tone and a leſs third, ſuch added diſcord muſt either be a whole tone above the fifth, or a whole tone below the octave of the fundamental: therefore, thoſe fundamentals which have a whole tone next above the fifth, are ſuſceptible of an added ſixth; and thoſe which have a whole tone next below the fundamental, or its octave, are ſucceptible of an added ſeventh.

162. As we have formerly ſeen, Art. 147. that the natural ſcale affords ſix perfect chords, *viz.* one for each degree of the ſcale, except the 7th; ſo we may here obſerve, that the ſame ſcale affords eight of this ſort of chords diſſonant by addition. This larger number of diſſonances by addition is occaſioned by the two fundamentals, *viz.* 2*f* and 5*f*, which are each of them ſuſceptible of both kinds of added diſcords.

Of theſe eight diſſonant chords there are four which have the added ſixth, *viz.* the K*f*, 4*f*, 5*f*, and 2*f*: and the other four have the added ſeventh, *viz.* the 6*f*, 2*f*, 3*f*, and 5*f*. But it is farther to be obſerved, that there are three with the added ſixth, and other three with the added ſeventh, which contain the very ſame degrees reſpectively, and differ only in the eſtimation of the fundamental. Thus the K*f*, with an added ſixth, contains the very ſame degrees as the 6*f*, with an added ſeventh; and the difference between theſe two lies only in the manner of conceiving the ſounds: ſo that the 6th of the ſcale, which is the added diſcord in the former, is the fundamental in the latter chord. In the ſame manner the 4*f*, with a ſixth added, and the 2*f*, with a ſeventh, conſiſt both of the ſame ſounds: thus alſo the 5*f*, with an added ſixth, and the 3*f*, with an added ſeventh, differ only in the manner of conceiving the ſounds; ſo that if we account the two chords, which thus coincide together, only as one, we ſhall reduce the number of diſſonances, by addition, in the ſcale, to five; of which ſee the following repreſentation, where the proper diſcord added, is denoted by a ſmall figure put over the fundamental.

The Chord of the
$\overset{6}{\mathrm{K}f}$ or $\overset{7}{6f}$ contains the K — 3d — 5th, 6th —
$\overset{6}{4f}$ or $\overset{7}{2f}$ contains the K 2d — 4th — 6th —
$\overset{6}{5f}$ or $\overset{7}{3f}$ contains the — 2d 3d — 5th — 7th
$\overset{7}{5f}$ contains the — 2d — 4th 5th — 7th
$\overset{6}{2f}$ contains the — 2d — 4th — 6th 7th

In this repreſentation, we have taken the liberty of inverting ſome of the chords, ſo as to comprehend all their ſounds within the compaſs of an octave above the key, to render the ſcheme more compact, and alſo that the occurrence of the ſame note, in different chords, may be more readily ſeen: and we ſay, as before, Art. 147. that theſe chords *contain* theſe ſounds reſpectively, to intimate that different arrangements ſtill conſtitute the ſame chord.

163. We may conclude, that there can be ordinarily no more than five chords diſſonant, by addition, among the ſounds of the natural ſcale, from obſerving, that there are but five degrees which are greater ſeconds, *i. e.* whole tones, and the diſ-

ſonant chord always contains a greater ſecond, or, which is the ſame in effect, a leſs ſeventh, among the mutual relations: See Art. 158.; and this leſs ſeventh is always divided by the other accompanying ſounds, into three intervals of a third each; one of which three is a greater third, and the other two are leſs thirds; and the greater third is either below the two leſs thirds, or between them, or above them, according as the ſteps of the natural ſcale allow.

164. In regard to the ſpecies of thirds, which reſult from the above-mentioned diviſion of the ſevenths, it will be uſeful to obſerve, that when the leſs ſeventh is added to a ♯ P chord, which can only happen in the chord of the 5*f*, the greater third is ſituated below two leſs thirds; and when the greater ſixth is added to a ♭ P chord, which can only happen in the chord of the 2*f*, the greater third is above two leſs thirds; but in all other chords diſſonant by addition, the greater third is between two leſs thirds.

165. The ſpecies of the three contiguous thirds, would be more eaſily ſeen, if each chord were diſpoſed in an erect form, ſo as to bring the proper fundamental, which bears an added ſeventh, into the loweſt place, and the ſeventh itſelf uppermoſt; for thus every chord would plainly appear to conſiſt of three ſucceſſive thirds, in aſcending from the fundamental, and the ſpecies of each third could not fail to be obvious, becauſe the very names of the ſounds expreſs their ſituation in the natural ſcale, and of courſe, the places of the ſemitones, which always conſtitute one of the two ſteps of a leſs third.

We ſhall inſtance the firſt of the chords in the ſcheme, Art. 162. which is that of the K*f*, with a ſixth, or the 6*f*, with a ſeventh added; therefore the 6th is to be brought into the loweſt place, and then the chord ſtands thus,

6th — K — 3d — 5th.

where we have three ſucceſſive thirds in aſcending from the 6th to the 5th. Now, the ſemitones being the next below the K, and the next above the 3d, it is plain, that the intervals 6th—K, and 3d—5th, are leſs thirds, becauſe they include one ſtep of a ſemitone: the interval K—3d is a greater third, becauſe both the included ſteps are tones: ſo that this chord is compoſed of a greater third between two leſs, as obſerved above.

After the ſame manner, the other chords, in Art. 162. might be arranged and examined; but this we ſhall leave as a taſk for the exerciſe of ſuch readers as do not clearly apprehend the ſtructure of them, in the ſeveral inverted forms there given. It may reaſonably be expected that few readers will have found any difficulty in this matter.

166. By obſerving the ſpecies of the thirds, we come eaſily to the knowlege of the *perfect* and *falſe fifths*, which exiſt in theſe chords: for if it be remembered, that two contiguous leſs thirds conſtitute a falſe fifth, Art. 148. it will evidently appear, that the chords which have the greater third, either below or above both the leſs thirds, have inevitably a falſe fifth, or by inverſion, a tritone, among their mutual relations: but the others, which have the greater third between the two leſs, have no ſuch interval. Thus, the two loweſt chords in the ſcheme, Art. 162.; *viz.* the 5*f* with a ſeventh, and the 2*f* with a ſixth added, have a tritone, *viz.* 4th — — 7th, which the three uppermoſt chords in that ſcheme have not: and herein conſiſts the moſt material difference among this ſort of chords, as will be ſhewn below.

167. The perfect chord of either kind, with an added ſeventh, is called *a chord of the ſeventh*, and figured with a 7. Sometimes one or both of the figures 5. 3. are added below the 7, or even above it; but this makes no difference, becauſe the ſounds repreſented by them are always implied, whether they be there or not.

168. The thorough-baſs may take any of the harmonics belonging to a chord of the ſeventh, *viz.* the third, the fifth, or the ſeventh; and hence ariſe three other chords by inverſion:

thus, when the thorough-baſs takes the third, the other accompanyments are ſixth, fifth, and third, to this baſs, and it is called *a chord of the ſixth and fifth,* and figured with 6 and 5, one under the other. When the thorough-baſs takes the fifth of the fundamental chord, the other accompanyments are ſixth, fourth, and third, to this baſs; and it may be properly called *a chord of the fourth and third,* and figured with 4 and 3, one under the other; the exiſtence of the ſixth being implied, tho' not figured: but it is more uſual, among our Britiſh muſicians, to add the ſixth alſo, both in the naming and figuring of this chord. When the thorough-baſs takes the ſeventh of the fundamental chord, the other accompanyments are ſixth, fourth, and ſecond to this baſs, and it is called *a chord of the ſecond,* and figured either with 2 ſimply, or with 4 and 2, or 6, 4, and 2: the exiſtence of the ſixth and fourth being implied along with the ſecond, although none but the ſecond be expreſſed either in the naming, or the figuring of this chord.

169. For the better underſtanding of the chord of the ſeventh, and its derivatives, ſee the following repreſentation of the chord of A, which is formed in the ſame manner as thoſe already given.

The chord of the ſeventh to A,	A—C—E—G
which we count	1—3—5—7
The ſixth and fifth to C,	C—E—G a
which we count	1—3—5 6
The fourth and third to E,	E—G a—c
which we count	1—3 4—6
The ſecond to G,	G a—c—e
which we count	1 2—4—6

See alſo Plate IV. Exam. XXXV. the firſt bar of the example; where the ſame chord of A, and its inverſions, are repreſented in the treble and baſs ſtaves, with the fundamental baſs ſubjoined. It may be obſerved, that when the baſs takes the ſeventh of the fundamental chord, it is not proper to double the baſs note in the accompanyment, as in the fourth chord of this bar, becauſe ſuch doubling would render the diſſonant ſeventh too remarkable.

170. In this example, the fundamental baſs is put A with 7, or C with 6 and 5; becauſe this, and its inverſions, produce, apparently, the very ſame ſounds as the other, and the difference lies only in the eſtimation of the fundamental. Thus, if the note C, bearing ſixth and fifth, were eſtimated the fundamental, the note A, bearing a ſeventh, would be one of its inverſions, and the note E, bearing fourth and third, and G, bearing a ſecond, would be its other inverſions.

171. It is often more proper to omit ſome of the ſounds of a diſſonant chord, in the accompanyment, and in ſeveral caſes theſe omiſſions may be, and uſually are, ſhewn by a different manner of figuring. Thus, for inſtance, if it be proper to omit the diſſonant ſeventh in a chord of 7, or the ſixth in a chord of 6 and 5. the thorough-baſs is left without any figure, or with ſuch only as denote the perfect chord, Art. 152.

Thus alſo, if the fifth be omitted in a chord of 6 and 5, or the fourth in a chord of 4 and 3, in ſuch caſes either of theſe chords is figured with 6 only, or with 6 and 3, to denote the exiſtence of the ſixth and third.

Again, if the third be omitted in a chord of 4 and 3, or the ſecond in a chord of 2, the thorough-baſs is figured with 6 and 4, becauſe in theſe caſes the ſixth and fourth only remain.

172 We muſt therefore take notice, that a chord in the thorough-baſs may put on the appearance of the perfect chord, or one of its inverſions, and yet in reality be derived from a fundamental diſſonant chord; with the omiſſion of one of the two contiguous ſounds, which conſtitute the diſſonance: and in order to comprehend this matter more fully, let the ſecond and third diviſions of Exam. XXXV. be carefully examined.

The former of theſe diviſions contains the derivatives of the chord of A, with 7, which, by omiſſion of the ſeventh, or of the eighth above the fundamental, appear to be the produce of the perfect chords of A, or C, reſpectively. The latter diviſion repreſents the derivatives of the chord of G, with an added 7, in the ſame manner: and here it muſt be obſerved, that although the original chord contains a falſe fifth, *viz.* from B to F. (ſee Art. 166.) yet when the octave of the fundamental is omitted, as in the three laſt chords of this example, the thorough-baſs is figured in the ſame manner as if the chords were derived from the perfect of B; although B is incapable of a perfect chord, on account of the falſe fifth. In this, and ſuch like inſtances, therefore, the falſe fifth, and the tritone or great fourth, are denoted in the ſame manner as if they were perfect; and it is left to the performer to apply ſuch intervals as the ſcale allows *; which ought to be well remembered.

173. In regard to the ſecond ſpecies of diſſonances, Art. 159. *viz.* thoſe which have another ſound ſubſtituted inſtead of one of the proper harmonics, the ſubſtituted ſound for the moſt part only diſappoints, or *ſuſpends*, the hearer's expectation, for ſome part of the time, and afterwards gives place to the proper ſound; and therefore theſe may be juſtly called diſſonances by *ſuſpenſion*.

The moſt common diſſonances of this claſs, derived from the perfect chord, are,

1*ſt*, The *chord of the fourth*, which is figured with a 4, or with 5 and 4; in which the fourth only ſuſpends the third, the fifth and octave at the ſame time taking place as uſual.

2*d*, The *chord of the ninth*, which is figured with a 9, or with 9 and 5, or 9 and 3; in which the ninth only ſuſpends the octave, but the fifth and third take place as uſual.

3*d*, The *chord of the ninth and fourth*, figured with 9 and 4, or 9, 5, and 4; in which both theſe ſuſpenſions take place at once, and the fifth only retains its proper place.

174. The ſame kind of ſuſpenſion frequently takes place in the chord of ſixth, *viz.*

1*ſt*, The ſeventh ſuſpending the ſixth, in a deſcending ſucceſſion, which is called a *ſequence of ſevenths and ſixths*, and figured with 7, 6. one after the other. Care muſt be taken to diſtinguiſh this ſeventh, ſuſpending the ſixth, in a deſcending ſequence, from the fundamental chord of the added ſeventh; becauſe they are both figured in the ſame manner with a 7. and yet the former muſt not be accompanied with the fifth, which is an eſſential part in the latter chord. But the figure 6 following upon the ſame note, ſufficiently indicates the ſequence.

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* There is a material difference between our method of figuring, and that of the French, in this reſpect. The French, following their great leader, Monſ *Rameau*, figure all their chords as if they were *full*, and leave the choice of *omiſſions* entirely to the performer's diſcretion; by which means the *derivation* of each chord is more plainly ſhewn, but the propriety and *delicacy* of the accompaniment is more obſcure and indetermined.

Thoſe chords in particular, which imply a falſe fifth, or a tritone, ſuch as the inverſions of the chord of G with a 7.; in the laſt diviſion of Ex. XXXV. are diſtinguiſhed both by peculiar names and figures. The chord of the 6 and 5. which has E for its baſs, is called, *accord de fauſſe quinte*, and figured with 5 ♭, or 5 with a daſh through the body; and this is conſtantly done, whether any omiſſions take place in the accompanyment or not. In like manner, the chord of 4 and 3, which belongs to the note D, is called *accord de ſixte ſenſible*, and figured with 6 ※, or 6 with a daſh through the head: and the chord of the ſecond to F, is called *accord de triton*, and figured with 4 ※, or 4 with a daſh through the horizontal ſtroke. See the figures ſubjoined to the thorough-baſs, in the laſt diviſion of Exam. XXXV.

The productions of other chords of the ſeventh, which do not include a falſe fifth, are named and figured much in the ſame manner as ours; and ſometimes the chord of the ſixth and fifth is called *accord de grande ſixte:* and that of the ſixth, fourth, and third, *accord de petite ſixte.*

Theſe are all the material differences between the Britiſh and French methods of naming and figuring the chord of the ſeventh, and its derivatives, which it ſeemed proper to explain in this place, more on account of the *theoriſts*, than the *compoſers*, which that nation has produced.

We flatter ourſelves, that, by following the Italians, we have adopted a better method of figuring, and of more immediate uſe to the performer; although the origin of ſome chords may, in our method, be more uncertain.

2*d*, The fifth ſuſpending the ſixth in an aſcending ſucceſſion, which is called a *ſequence of fifths and ſixths*, and figured with 5, 6, one after the other.

3*d*, The ninth may ſuſpend the octave and the ſeventh ſuſpend the ſixth, both at the ſame time, in a chord of the ſixth; in which caſe the third only retains its proper place; and this is called a *chord of the ninth and ſeventh*, and figured with 9 and 7, or with 9, 7, and 3.

175. Some of theſe chords may be inverted, and from thence other chords formed, which have alſo their proper uſe; and beſides the above, there are ſeveral other ſuſpenſions practicable in muſic, the full detail of which would be too tedious in this place. It may be obſerved in general, that ſuch paſſages ſometimes affect the fundamental progreſſion, and ſometimes not: and they are then only, properly ſuſpenſions, when the fundamental progreſſions is not affected by them.

176. In order to judge of the fundamental to which a diſſonant chord ought to be refered, it is uſeful to obſerve, that every note which has its own harmonics, and eſpecially its fifth exiſting along with it, will in ſome degree attract our attention as a fundamental, agreeable to what is remarked, Art. 155.; and if, in conjunction with this circumſtance, ſuch a note be rendered more diſtinguiſhable, by its ſituation below or above the reſt, as explained, Art. 144. it will inevitably be regarded as a governing fundamental, for the time: but if it be concealed in the middle of the chord, another note, in a more conſpicuous ſituation, may take the preference.

It will be neceſſary alſo, in conſidering the ſucceſſive chords, as connected together in *harmonic phraſes*, to take into account the *expectation*, whether founded on *nature* or *cuſtom*, of hearing ſuch particular fundamentals in ſucceſſion, which often takes place, and may be ſo ſtrong, in ſome paſſages, as to overcome all oppoſition in favour of a different fundamental note.

177. Such enquiries as theſe are of the utmoſt conſequence in muſic, and are yet perfectly new. The various effects of different inverſions of the ſame chord, which are circumſtances well known among the practical muſicians, but impenetrable ſecrets among the theoriſts, are by this means accounted for, with the greateſt eaſe and ſimplicity. We ſhall here add a few inſtances.

178. The chord of the ſeventh, when the fundamental bears a leſs third, may be conſidered as a mixture of two perfect chords, whoſe fundamentals are the two terms of the ſame leſs third. Thus the chord of A with a ſeventh is made up of the ♭P chord of A, and the ♯P chord of C; becauſe each of theſe notes has its perfect chord in the accompanyment. Now, if this chord be arranged in its erect form, as at H, in Exam. XXXVI. in this caſe the note C, being partly concealed in the middle, and A at the bottom, the note A is undoubtedly the governing fundamental: but at K the ſame chord is arranged with C uppermoſt, and A in the middle; in which caſe C will command our principal attention. At L, the note A is uppermoſt, and C loweſt; which cauſes a divided attention, or *double fundamental*, and the preference due to one or the other is to be determined from other conſiderations. The caſe is much the ſame at I, where both C and A are in the middle.

In theſe ambiguous caſes, if one of the notes which thus ſtand in competition, be doubled, or be made more remarkable by falling in with the expectation of the hearer, the choice will be determined by either of theſe circumſtances.

In the ſtaff of lines ſubjoined to Exam. XXXVI. the governing fundamentals are repreſented by notes, and the other by directs: and the ambiguous or double fundamentals have two directs.

179. Theſe ambiguities have no place in a chord of the ſeventh, when the fundamental bears a greater third, becauſe the fifth above that greater third is a falſe fifth. Thus, for inſtance, the chord of G with a ſeventh, and all its inverſions, muſt in-

conteſtibly be refered to G*f*, becauſe no other ſound has its perfect fifth exiſting along with it, in that chord.

The falſe fifth has alſo a very peculiar property of refering the hearer to a fundamental note, at the diſtance of a greater third below its lower term, even although that fundamental note do not appear at all, in the chord. Thus the falſe fifth B - - - F, will plainly point out G for its fundamental, though G itſelf be altogether omitted, as at M, Exam. XXXVI. The ſame is to be obſerved of all other falſe fifths: for inſtance,

F※ — — — C muſt be refered to D*f* ——
C※ — — — G to A*f* ——
G※ — — — D to E*f* —— &c.

and this property muſt be carefully attended to.

180. The tritone, which is the inverſion of the falſe fifth, rather refers to a fundamental, at the diſtance of a leſs third below its lower term. Thus the tritone F — — B has a natural tendency to point out D for its fundamental; eſpecially if the note A be heard along with it, as repreſented at N: becauſe A is the perfect fifth to that fundamental; and moreover the ſame A prevents G from taking place as a fundamental; whereas if A were not heard, and if the ſucceſſion of chords could conveniently admit of it, G might be eſteemed the fundamental of the tritone F — — B, as well as of the falſe fifth from which it is an inverſion.

There is ſomething curious in theſe effects of the falſe fifth and tritone, which we ſhall endeavour to account for in the theory.

181. The chord of the fourth, as repreſented at O, is a mixture of the chord of the ſuſpending fourth, along with that of the fundamental; becauſe this chord conſiſts of the fundamental, with its perfect fifth, and the fourth with its perfect fifth; but then the fundamental, being both in the loweſt and higheſt place, will undoubtedly attract our principal attention: and even if the fourth were to poſſeſs the higheſt place, as at P, the ſame fundamental would ſtill prevail, becauſe it is more natural to conceive the loweſt ſound as a fundamental, than the higheſt. But if the ſame chord be inverted, as at Q, where the fourth poſſeſſes the loweſt place, the caſe will be altered, and in this chord, ſingly conſidered, the loweſt ſound will become the governing fundamental; and the chord be effectually a chord of the ninth, to that fundamental; but yet, in a ſucceſſion which more properly leads to the fundamental of the original chord O, even this arrangement at Q may paſs for an inverſion of that chord, and in ſuch caſes it ought to be figured with 5 and 2, as it is there done, and care muſt be taken not to double the baſs note in the accompanyment, becauſe it is not one of the proper harmonics of the chord.

The ſame is to be obſerved of the arrangement at R, which is an inverſion of the ſame chord of the fourth, having the fifth loweſt. This chord, ſingly conſidered, would ſeem to belong to the higheſt ſound as fundamental, but when it occurs in a ſucceſſion wherein it may properly be taken for an inverſion of the chord at O, it is then to be figured with 7 and 4. And this, as will be ſhewn, Art. 186. is the only proper introduction of the ſeventh and fourth to any baſs note.

182. The chord of the ninth, at S, is a mixture of the chord of the fifth note, along with that of the fundamental; becauſe the ninth ſtands as a fifth to the fifth note: but here the fundamental will naturally take the preference, as being the loweſt ſound, and therefore this ninth is properly a ſuſpenſion.

The ſuſpending ninth may be a falſe fifth above the fifth note of the chord, in which caſe the fifth note is incapable of being a fundamental; and this happens in the chord of the 3*f* of the natural ſcale, as in the chord of E, repreſented at T: and here we have a right to conclude, from the property of the falſe fifths, deſcribed, Art. 179. that the attention of the hearer is divided between G and E, that is, between the fifth and the third of the natural ſcale.

Q

There may be other chords formed by inverting the chord of the ninth, but being very rarely made uſe of, we ſhall paſs them over at preſent.

183. The chord of the ninth and fourth, as at U, tends ſtill more directly than that of the ſimple ninth towards introducing the fifth note for a fundamental, in preference to the loweſt note; becauſe here, the ſuſpending fourth, not only hinders the enterance of the third, which is one of the proper harmonics of the loweſt note, but that fourth alſo ſtands in the relation of a ſeventh to the fifth, which circumſtance alſo gives additional influence to the fifth; and therefore we conclude this chord, even in its erect form, to have a dubious or double fundamental, as repreſented in the example.

184. The ſeventh ſuſpending the ſixth in a deſcending ſequence, when that ſeventh is a perfect fifth above the third, tends to introduce the ſame third for a fundamental, and the ſixth which follows and *reſolves* the ſeventh, has a right by its ſituation to be regarded as the fundamental of the next chord, as repreſented at W.

185. Upon the ſame principles, the fifth ſuſpending the ſixth, in aſcending, when it is perfect, will appear to introduce along with it the loweſt note of the chord, for a fundamental, during its exiſtence; and when the ſixth ſucceeds to the fifth, that ſixth appears to have a right to be conſtituted a fundamental, as ſhewn at X. But in both theſe ſequences the expectation of the hearer often counteracts theſe motives, and obliges us to aſſign other fundamentals to ſeveral of theſe chords, as will be ſhew when we come to treat of fundamental progreſſions.

186. To finiſh this diſquiſition at preſent, which probably the reader, not acquainted with the application, will have thought too long; we ſhall obſerve in general, that the co-exiſtence of the perfect fifth above, or fourth below any ſound, ſerves to *fortify* that ſound, and to draw the hearer's attention to it, much in the ſame manner as if it were doubled; and therefore it is not proper to introduce a note, by ſuſpenſion, which has its perfect fifth in the chord, unleſs that note could properly take place as a fundamental; and it is equally improper that the ſuſpending note ſtand as a fifth to any of the other notes of the chord, unleſs that other note could, on occaſion, ſucceed as fundamental. Thus, for inſtance, the ſixth muſt not be made to ſuſpend the fifth, in a perfect chord, at the ſame time that the third keeps its place, becauſe that third, exiſting along with the ſixth, would in effect double the ſuſpending ſixth, and render it too remarkable; but the ſixth may ſuſpend the fifth, at the ſame time that the fourth ſuſpends the third, and this is very frequently practiſed. Thus alſo, in a chord of 7, the fourth muſt not ſuſpend the third, becauſe that fourth would render the diſſonant ſeventh too remarkable by its affinity with it. The ſame obſervations may be extended to all the other chords.

187. The new principle we have chiefly to inſiſt upon, which accounts in the moſt familiar and rational manner for the various ſucceſſions of diſſonant chords, practicable in muſic, is, that almoſt all chords of this kind imply, in ſome degree, a *double fundamental*, and that it is neceſſary that each of the implied fundamentals naturally follow what has preceeded, and alſo be naturally ſucceeded by what follows: and this principle, joined with a certain propenſity in ſome ſounds to deſcend, and in others to aſcend, which ſeems to depend partly upon their relations to the key note, abſtract from any regard to the fundamental preſently exiſting, and which we ſhall endeavour to explain in due courſe, will carry us with eaſe and perſpicuity through a ſubject which has hitherto perplexed and baffled the moſt diligent enquirers.

188. The following recapitulation of the chords explained in this and the preceding chapter, will be of ſervice to aſſiſt the learner's memory.

1. *The perfect, or common chord*, conſiſts of the 8th, 5th, and

3d, to the baſs note, and is denoted by all or any of theſe figures, or is underſtood to take place when no figure is annexed to the baſs — the 3d may be greater or leſs, and the fifth perfect or falſe, according as the ſcale allows, in which the muſic is ſet.

2. *The chord of the ſixth*, conſiſts of the 8th, 6th, and 3d, and is figured with 6, either with or without the other figures. It is an inverſion of the perfect chord, the baſs taking the third note of that chord.

3. *The chord of the ſixth and fourth*, conſiſts of the 8th, 6th, and 4th, and is figured with 6 and 4. It is an inverſion of the perfect chord, the baſs taking the fifth note of that chord.

4. *The chord of the ſeventh*, is the perfect chord with the 7th added, and is figured with 7. either with or without any of the figures 8. 5. 3. — It is the chief of all diſſonances by addition, and all the others may be deduced from it, by inverſion.

5. *The chord of the ſixth and fifth*, is the perfect chord with a 6th added; or it is an inverſion of the chord of the ſeventh, the baſs taking the third note of that chord, and is figured with 6 and 5.

6. *The chord of the fourth and third*, commonly called *ſixth, fourth, and third*, and figured accordingly, is an inverſion of the chord of the ſeventh, the baſs taking the fifth note of that chord.

7. *The chord of the ſecond*, conſiſts of the 6th, 4th, and 2d, and is figured with 2, either with or withont the other figures. It is an inverſion of the chord of the ſeventh, the baſs taking the ſeventh, or diſſonant note of that chord.

8. *The chord of the fourth*, is the perfect chord with the 4th inſtead of the 3d, and is figured with 4, or with 5 and 4. Here the 4th only ſuſpends the 3d for a time, and muſt afterwards deſcend into it.

9. *The chord of the fifth and ſecond*, figured with 5 and 2, is an inverſion of the chord of the fourth, the baſs taking the fourth or ſuſpending note of that chord.

10. *The chord of the ſeventh and fourth*, figured with 7 and 4, is an inverſion of the chord of the fourth, the baſs taking the fifth note of that chord.

11. *The chord of the ninth*, is the perfect chord with the 9th inſtead of the 8th, and is figured with 9, either with or without the figures 3, 5. Here the 9th only ſuſpends the 8th for a time, and muſt afterwards give place to it.

12. *The chord of the ninth and fourth*, figured with 9 and 4, or 9, 5, and 4, is the perfect chord with the 9th, ſuſpending the 8th, and the 4th ſuſpending the third, both at the ſame time. Theſe notes muſt afterwards give place to the proper harmonics.

13. *The ſequence of ſevenths and ſixths*, figured with 7 and 6, one after the other, is a chord of the ſixth, wherein the 7th ſuſpends the 6th, in a deſcending ſucceſſion, for ſome part of the time, and afterwards gives place to it.

14. *The ſequence of fifths and ſixths*, figured with 5 and 6, one after the other, is a chord of the ſixth, in which the 5th ſuſpends the 6th, in an aſcending ſucceſſion, for ſome part of the time, and afterwards gives place to it.

15. *The chord of the ninth and ſeventh*, figured with 9 and 7, or with 9, 7, and 3. is a chord of the ſixth in which the 9th ſuſpends the 8th, and the ſeventh ſuſpends the 6th, both at the ſame time. Theſe notes muſt afterwards deſcend.

Signior *Paſquali*, in his *Thorough-Baſs*, enumerates and exemplifies twelve chords, as being all which ordinarily occur. The reader, who is acquainted with that valuable piece, will obſerve, that eleven of them are in this recapitulation, beſides two others at N° 9 and 10. which are not there.

The chord in *Paſquali*'s book, which we yet want, is that of the 2d, 4th, and 7th, and is only introduced *by licence*, when the baſs holds upon the key-note, of which we ſhall ſpeak hereafter.

CHAP. VIII. *Of* FUNDAMENTAL PROGRESSIONS.

189. IN regard to fundamental progreſſions, it is of the greateſt importance to underſtand well the paſſages called *cadences* in muſic, and therefore we begin with theſe.

Cadences in muſic are like points in writing, or pauſes in ſpeaking; and ſerve in the ſame manner to diſtinguiſh the ending of every ſmaller portion, or *phraſe*, as well as of the whole piece: and as there are different ſorts of pauſes neceſſary to mark out the larger, and the leſs diviſions of a ſentence, ſo there are different ſorts of cadences, ſome more and ſome leſs ſatisfactory and concluſive.

190. The ſpecies of a cadence depends on the mutual relation of two ſucceſſive chords, the latter being always on the moſt accented or emphatical part of the meaſure, as at the beginning of a bar. The former of theſe is called the *leading chord*, and the cadence is ſaid to be *made upon* the latter; which manner of ſpeaking is currently made uſe of among muſicians, and muſt be well obſerved in order to the underſtanding of what follows.

191. When the fundamental baſs falls a fifth, or riſes a fourth, upon an accented part of the meaſure, that paſſage is called a *regular cadence*; and when the leading chord of ſuch a cadence bears a greater third and a ſeventh, it is called a *perfect regular cadence*; but when the leading chord bears a leſs third, the cadence is *imperfect*, and inconcluſive.

The perfect regular cadence upon the principal key muſt always conclude the piece, like the full ſtop in writing; and there is no other way in nature of coming into the chord of the key, without leaving an expectation of ſomething more to follow, but by the chord of the 5*f*, bearing a greater third and ſeventh, as a leading chord.*

192. In order that this cadence be fully ſatisfactory, it is neceſſary alſo, that the thorough-baſs coincide with the fundamental; or, in other words, the chords which conſtitute the final cadence, muſt not be inverted, but taken in their erect form; that is, the thorough-baſs muſt paſs from the 5th upon the K, either by a leap of a fourth aſcending, or a fifth deſcending.

We muſt likewiſe obſerve, that the harmonics, or accompanyments of the perfect regular cadence, are alſo limited in their progreſſion. Thus the leading chord of the 5*f* contains.

5th — 7th — 2d — 4th.

Now, as the baſs which takes the 5th muſt paſs by a leap into the K, ſo the part which takes the 7th muſt aſcend by a ſtep of a ſemitone into the ſame K, or its octave, the 2d ought to deſcend by a tone upon the ſame K, and the 4th muſt deſcend by a ſemitone upon the 3d. This is the final cadence in four parts; of which ſee the following repreſentation.

——— 5th — 7th — 2d — 4th
⏝
K ———— — K — 3d

where the meeting of the 7th and 2d, upon the ſame K, in the ſubſequent chord, is denoted by the horizontal bracket.

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* The French theoriſts call the chord of the key *la tonique*, and this leading 5 *f*, *la dominante tonique*, as if this chord governed the other, becauſe the other is obliged to follow it; but in truth the key governs all the reſt, and therefore this method of naming the chords, though but lately adopted, ſeems to need a further reformation. The leading chord which bears a leſs third and ſeventh, is called by the French, *dominante ſimple*.

See alſo Exam. XXXVII. Plate IV. at the letter H, where the ſame cadence upon C is repreſented in the treble and baſs ſtaves, and the natural progreſſion of the notes in the accompanyment is ſhown by the direction of ſmall ſtrokes inſerted between the two chords.

It may ſeem prepoſterous to begin the article of fundamental progreſſions with explaining the final paſſage, but nevertheleſs it is the moſt proper way, for this plain reaſon, becauſe it is the moſt ſatisfactory of all paſſages, and the only one which puts an end to the expectation of the hearer; and by examining what way this expectation may be ſatisfied, and the attention wholly fixed upon one chord, we come eaſily to underſtand how it may be diſappointed or ſuſpended, and the attention carried to different chords. Add to this, that the ſame kind of cadence, made ſucceſſively upon different notes, proper for the purpoſe, will be found to conſtitute more than one half of all fundamental progreſſions.

193. The moſt remarkable circumſtance, and what inevitably attracts the chief attention of the hearer, in this regular cadence is, the *reſolution* of the falſe fifth, which exiſts in the leading chord. It is an undoubted fact, that whenever a falſe fifth is perceived, and ſuch can ſcarcely ever paſs unperceived, it immediately becomes our principal concern to hear its terms reduced to a better agreement; the jarring ſounds muſt be reconciled before we leave them, and this is what we call the *reſolution* of the diſcord.

The falſe fifth in the leading chord muſt be reſolved by its two terms *approaching nearer together*, and conſtituting a third in the following chord; thus in the leading chord deſcribed above, the falſe fifth exiſts between the 7th and the 4th, and theſe two ſounds approaching nearer together, each by a ſtep of a ſemitone, conſtitute a greater third, *viz.* K—3d, in the next chord; and this ſucceſſion is ſo conformable to the expectation of the ear, that we cannot go contrary to it, with any degree of ſatisfaction. The 7th muſt by no means deſcend, nor the 4th aſcend, nor muſt either of them keep their place when another chord ſucceeds.

194. The ſecond is not ſo ſtrictly limited in its progreſſion to deſcend upon the K, for in ſome caſes it may with equal propriety aſcend into the 3d, as ſhewn at I. Exam. XXXVII. In the ſituation repreſented at H, it would have been improper to have both the 2d and 4th meeting upon the 3d, becauſe that 3d being the higheſt note, would by that occurrence be rendered more remarkable than it ought to be in a final chord: but this can be ſafely allowed at I, becauſe here the 3d is in a more obſcure place, being, as it were, concealed below the octave of the K.

195. There may be two other parts added to the final cadence as repreſented at I; *viz.* one which takes the 5th and continues upon it, and another which takes the 2d, and deſcends into the K; and thus the cadence will conſiſt of ſix parts, as ſhewn at K: where the ſmall ſtrokes inſerted between the chords ſtill ſhew the progreſſion of each part, and the two which iſſue from the note D, in different directions, ſhew that two parts are ſuppoſed to have previouſly taken that note, and muſt go from it in different progreſſions, one deſcending upon the K, and the other aſcending upon the 3d.

196. We may obſerve in general, that the natural deſire of hearing a diſcordant interval *properly reſolved* always limits, in ſome degree, the progreſſion of the terms of ſuch an interval; while the other ſounds, which are concordant, are at liberty in that reſpect. Thus in all the arrangements of the perfect regular cadence, the two terms of the falſe fifth muſt take their limited courſe, *viz.* the fourth of the ſcale, which ſtands as a ſeventh to the 5*f*, and is the upper term of the falſe fifth, muſt deſcend; and the 7th of the ſcale, which is the third to the 5*f*, and the lower term of the falſe fifth, muſt aſcend: theſe motions may be called *neceſſary* in this cadence,

while the progreſſion of the 2d, which ſtands as a fifth to the 5*f*. and of the 5th, being the octave to the 5*f*, when theſe notes take place in the leading chord, is unlimited, or *accidental*, and may be various according to the different deſigns of the compoſer. Thus if a final cadence, or *cloſe*, be intended, the leading chord muſt be ſo diſpoſed as that the *neceſſary motions* may lead into one of the arrangements of the chord of the key which is denominated final, in Art. 145, 146. and the *accidental motions* muſt be ſo conducted as not to counteract this deſign, by fortifiying, or rendering too remarkable, the harmonics of the K, which ought, in this caſe, to make no other appearance than as dependents upon the principal. This will appear to be the rule obſerved in the arrangements deſcribed above. The ſame conſiderations muſt be attended to in the formation of all other final cadences; of which we cannot fail to meet with ſufficient examples, in the proſecution of this ſubject.

If the regular cadence be introduced, as it frequently is, in the courſe of a piece, where the expectation needs not to be fully ſatisfied, and where a cadence may with equal propriety be made upon one of the chords called medial, in theſe caſes the neceſſary motions muſt ſtill be conformed to, the falſe fifth muſt ſtill be properly reſolved, but the accidental motions may be taken at pleaſure, as beſt ſuits the air of the upper part in which they occur: the chords may be inverted, and by this means the thorough-baſs may take the air of an upper part, and a vaſt variety of paſſages be introduced, which, to an unſkilful perſon, will appear widely different, and yet in reality all depend upon the ſame fundamental progreſſion: for the underſtanding of which matter, the learner is deſired to examine carefully the latter part of the XXXVII example, with the following Annotations.

197. ANNOTATIONS to Exam. XXXVII.

In this example, the reference letters H. I. K. *&c.* are not affixed, as formerly, to a ſingle chord, but are placed at the bar between the two chords which form the cadence, to intimate that it is not a ſingle chord, but a ſucceſſion or paſſage from one to another, that is thereby refered to.

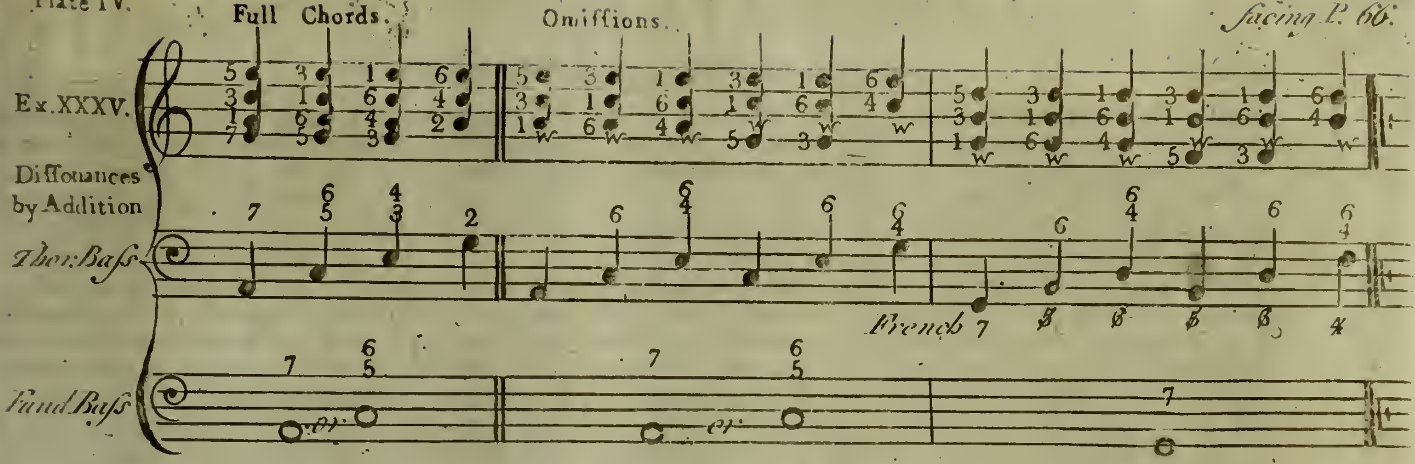
The paſſages at H. I. K. repreſent the final cadence upon C in different arrangements, as already explained, the laſt of which at K contains ſix different motions or parts; and theſe are afterwards ſingled out, and extended into ſix bars, repreſenting as many ſucceſſive cadences in the treble, with a baſs put below, wherein ſeveral inverſions are introduced in the four firſt cadences.

At L the treble aſcends from the 7th to the K, which is one of the neceſſary motions in the regular cadence; but the baſs, inſtead of falling upon the K, takes the 3d, bearing a chord of the 6th, inverted from the perfect chord of the K*f*, ſo that the fundamental progreſſion is not affected by this change in the baſs, altho' the cadence is thereby rendered inconcluſive or medial.—In this paſſage the ſeventh is not added to the leading chord, becauſe it is ſuppoſed that the ſtrain begins here, and it would be unnatural to begin with a diſſonant chord. The other notes which would be neceſſary to fill up the accompanyment in this and the following paſſages, are ſhewn by directs, placed in the treble ſtaff. It may be obſerved here, that the note D, or the 2d of the ſcale, muſt deſcend into the K, as it is not allowed to aſcend upon the 3d, becauſe the baſs takes that ſame note, and being only conſidered as a dependent upon the K*f*, it muſt not be doubled.

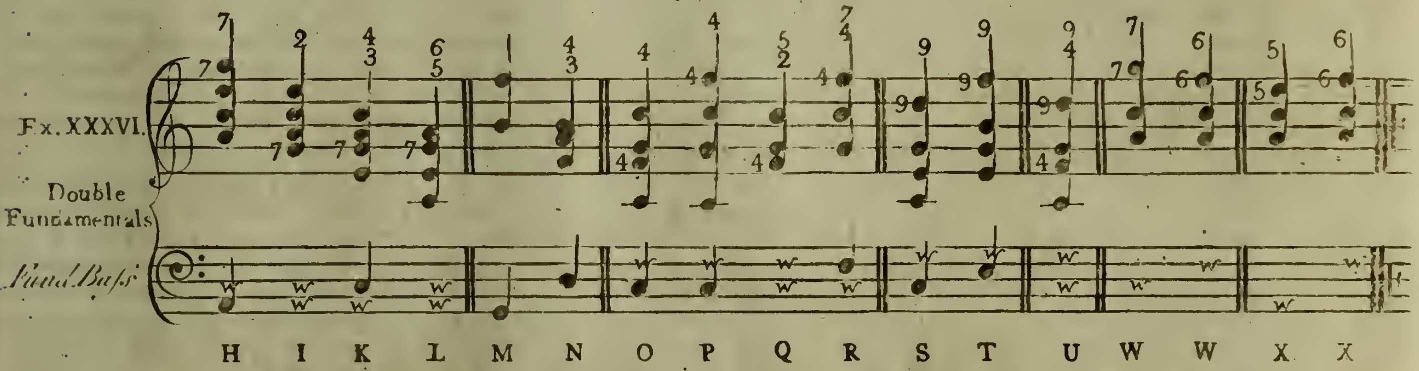
At M the fundamental chords are both inverted, and the baſs, having taken the 4th of the ſcale, *viz* the ſeventh of the leading chord, figured with a 2, is obliged to fall upon the 3d in the following chord, this being one of the neceſſary motions, as explained above. Theſe baſs notes are not doubled in the accompanyment, for the reaſons formerly given.

At N the baſs takes the 2d of the ſcale, *viz.* the fifth of the

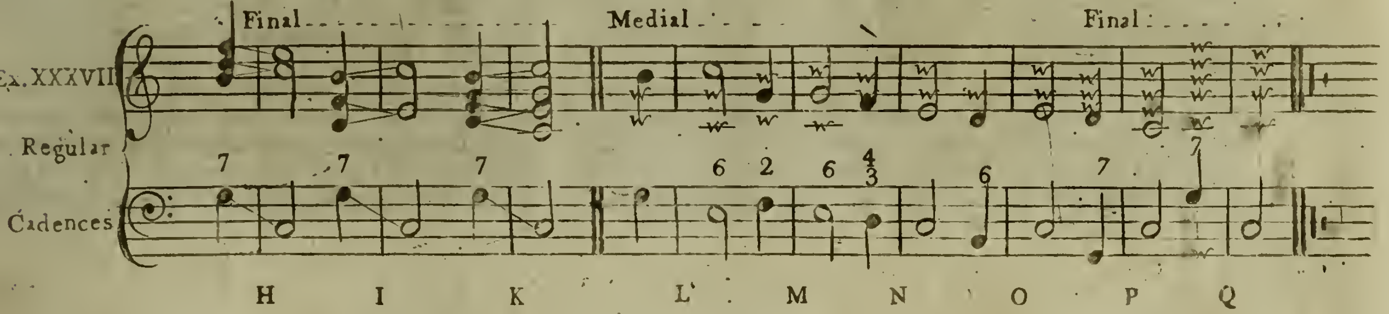
Ex. XXXV.

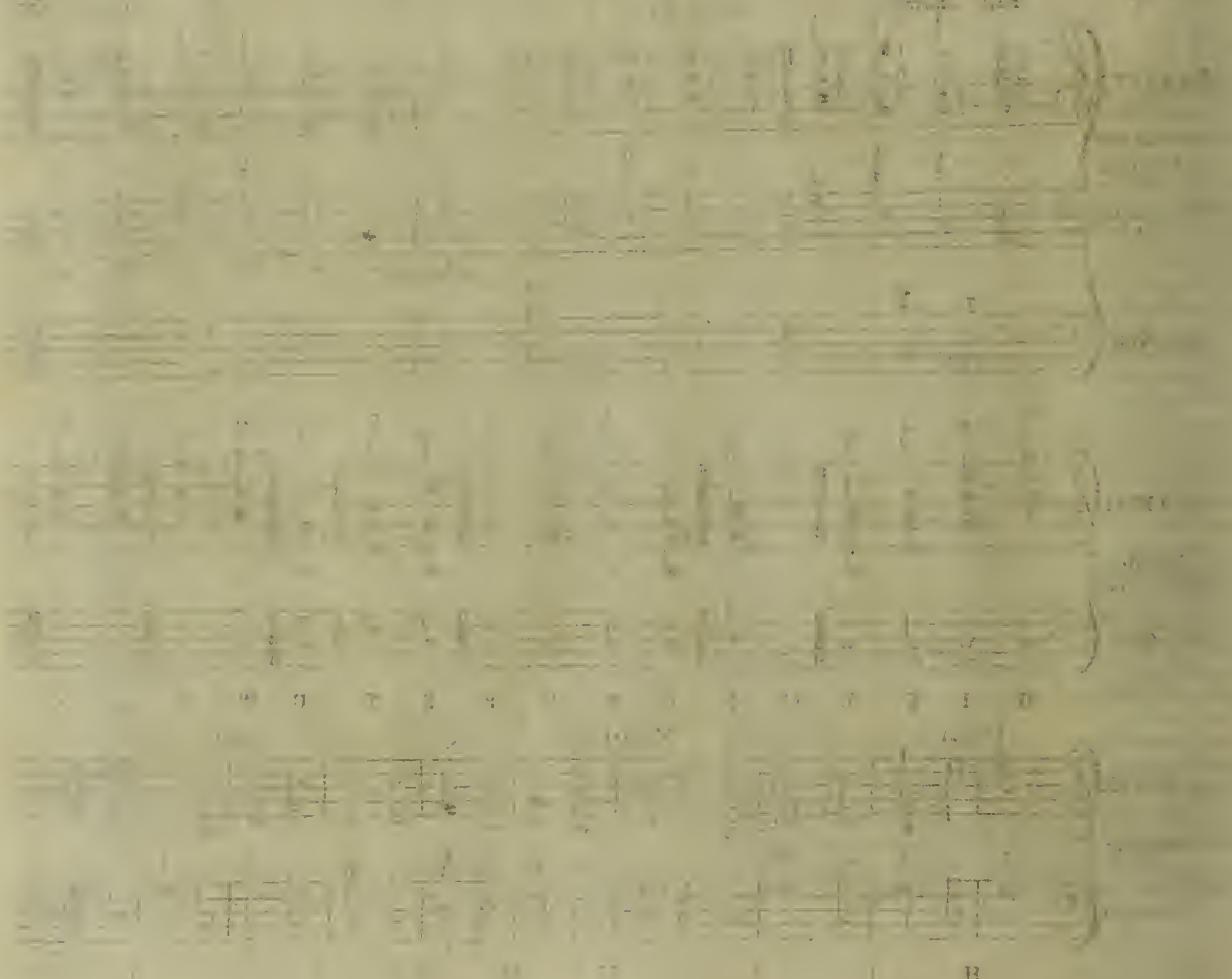


Ex. XXXVI.



Ex. XXXVII.





leading chord, figured with 4 and 3, and from thence deſcends by a ſtep into the K, which is the only proper motion in this place, becauſe the treble, taking the 4th of the ſcale in the leading chord, is neceſſitated to deſcend upon the 3d, and it would be improper to have this note doubled, therefore the baſs is not allowed to aſcend.

At O the baſs having taken the 7th of the ſcale, *viz.* the third of the leading chord, is obliged to aſcend into the K, and the treble at the ſame time aſcends from the 2d into the 3d, upon which account it becomes improper to let the diſſonant 4th be heard at all, in the leading chord; becauſe the reſolution of that fourth upon the ſame third would render it too remarkable. If the treble had deſcended upon the K, which it might have done with equal propriety, the 4th might then have been admitted in the accompanyment, as it is in the next cadence at P. The omiſſion of the diſſonance at O is ſhewn, as obſerved, Art. 171, 172. by the figuring; for the full chord would have been figured with 6 and 5. Beſides this omiſſion we muſt obſerve alſo, that the octave of the baſs note is left out in the accompanyment of the leading chord at O, becauſe it would be equally improper to double that note, which is the third to the fundamental, in the leading chord, as to double the third to the K in the following chord; ſo that in this paſſage the accompanyment of the leading note conſiſts only of two ſounds.

At P the baſs coincides with the fundamental progreſſion, while the treble deſcends from the 2d upon the K, which circumſtances agree with the characteriſtics of a final cadence, and give liberty to add all the harmonics of both chords. The ſame is done at Q in the fulleſt manner, which can properly be admitted. At P the cadence conſiſts of four upper parts and a baſs; at Q we have five upper parts and two baſſes, beyond which it is impoſſible to go, without tranſgreſſing the neceſſary rules of harmony. The cadence at Q cannot be played full upon the harpſichord, becauſe the fingers cannot be extended to reach the note D, which is below the treble ſtaff; but the effect is ſcarce ſenſibly different if this note be omitted, becauſe it is repreſented by the upper D, which is its octave

198. In the courſe of the preceding article, a queſtion may very probably have occurred to the attentive reader, which it may ſeem neceſſary to anſwer, before we proceed further. The propriety of ſeveral omiſſions there pointed out appears ſufficiently plain, when the different parts are allotted to different voices or inſtruments, in a choir or concert; becauſe the coincidence of two parts upon the ſame ſound will evidently render that ſound ſtronger than the reſt; but what occaſion is there for any ſuch reſtrictions, in filling up the chords of a thorough-baſs upon a harpſicord, where the accompanying ſounds, if ſtruck at all, can neither be ſtronger nor weaker in whatever ſucceſſion they occur? In anſwer to this it may be obſerved, that the impoſſibility of making one particular ſound in a chord either ſtronger or weaker, upon occaſion, is one principal reaſon why theſe reſtrictions muſt be more carefully conformed to, in playing thorough-baſs, than in compoſing for ſeparate detachments of a choir. An experienced ear will not fail to perceive every accompanying ſound, and, as it were, *analize* the ſucceſſive chords; and alſo will aſſign to each ſound its due progreſſion, eſpecially as far as relates to the motions called *neceſſary;* and by this means the coincidence of two parts upon the ſame note comes to be *plainly felt*, even in the accompanyment of a thorough-baſs, and the diſappointment which we find in hearing the ſound, upon which two parts are thus conceived to meet, no ſtronger in reality than we might expect either part ſingly to have produced, is more deſtructive of the good effect of the whole, than if ſuch a coincidence were diſtinguiſhed by the ſuperior ſtrength of the note. This is one inſtance of a note *rendered more diſtinguiſhable by the ſucceſſion in which it occurs*, as hinted, Art. 144.; and to hear ſuch a note only juſt of equal ſtrength with either of thoſe which lead to it, is

as unnatural, as to ſee the trunk of a tree only juſt of equal bulk with the branches that iſſue from it.

199. This ſhort ſurvey of the accompanyments, or upper parts which properly belong to the regular cadence, in its different arrangements, will appear to be no digreſſion from the principal ſubject of this chapter, if we conſider, that the melody or air of the upper parts of a compoſition, is undoubtedly the moſt apt to engage our attention ; and therefore if we would avail ourſelves of the knowledge of the fundamental principles, to the beſt purpoſe, it is proper to conceive the fundamental progreſſions as ſuggeſted by, or at leaſt ſomeway connected with, certain correſpondent motions or paſſages in the upper parts. A familiar acquaintance with the fundamental progreſſions is undoubtedly the principal requiſite in the ſkill of muſic, but the paſſages of melody are more obvious and more engaging, and therefore it is not improper to aſſociate theſe two particulars, ſo that the moſt uſeful knowlege may, by this means, be drawn from the moſt familiar obſervations.

200. Beſides the perfect regular cadence upon the principal key, we can alſo admit the ſame paſſage to be made occaſionally, upon the 4th, or the 5th, or the 6th of the natural ſcale, as dependents on the principal, without altogether adopting any of theſe for a new key ; provided due care be taken not to dwell too long, or recur too often upon them, without a proper intermixture of other paſſages proper to keep the ear in ſuſpenſe, or to renew the impreſſions of the principal key. But we cannot make a regular cadence upon the 2d or 3d of the natural ſcale, without previouſly adopting a new key, different from the key of the natural ſcale : and on the 7th we cannot make a regular cadence at all.

In order to explain this matter in the moſt intelligible way, we ſhall find it convenient to apply the terms *adjunct 4th*, *adjunct 5th*, and *ſubſtituted 6th*, to the notes upon which we admit occaſional cadences, as above. The reaſon of theſe appellations will appear hereafter.

201. Each of theſe cadences implies an occaſionally altered note in the leading chord which precedes it ; as will plainly appear from the characteriſtics of a leading chord in a perfect regular cadence, given above, *viz.* that it muſt bear a greater third, and a leſs ſeventh, and conſequently comprehend a falſe fifth between the ſame third and ſeventh. Now, there is no degree of the ſcale, except the 5th, which has this kind of chord among the ſeven natural ſounds : for although the K and 4th have each of them a greater third, they have alſo each of them a greater ſeventh in the ſcale, and the other degrees, except the 5th, which have a leſs ſeventh, have at the ſame time a leſs third.

This cadence on the 4th implies the flat 7th, in its leading chord, *viz.* a flat 7th added to the ※P of the K*f*.

The ſame cadence on the 5th, implies the ſharp 4th in its leading chord, which ſharp 4th ſtands as a greater third to the 2*f*, with an added ſeventh.

The ſame cadence upon the 6th implies a ſharp 5th, which ſtands as a greater third to the 3*f*, with an added ſeventh.

The two former of theſe cadences end with a ※P chord on the 4th and 5th reſpectively, but the laſt ends more naturally with a ♭P chord on the 6th.

The reader will readily excuſe our not entering here upon a critical enquiry into the *reaſon* why theſe perfect regular cadences, and no others, can be admitted, without formally eſtabliſhing a new Key. This is rather to be expected in the theory ; and it is ſufficient at preſent to remember, that every altered note by an occaſional ſharp or flat, will always be either a ſharp 4th, or a ſharp 5th, or a flat 7th, in the natural ſcale which takes place at the time ; and that the ſharp 4th belongs to the chord of the 2*f*, as a leading chord in a cadence upon the 5th : the ſharp 5th belongs to the chord of the 3*f*, as a leading chord in a cadence upon the 6th ; and the flat 7th belongs to the chord of the K*f*, as a leading chord, in a cadence upon the 4th: And that although a regular cadence, made upon any of theſe degrees of the ſcale, tends directly to the introduction of that degree for a *new key*, yet ſuch cadences may be, and ſome of them generally are, interſperſed through the whole of a piece of muſic, even where the principal key is all along retained in the ſtricteſt manner *.

202. The occaſional flat or ſharp note is ſhewn, in the natural ſcale of C, by prefixing the proper character immediately before the note; and it is to be obſerved, that as either of theſe marks, placed at the cliff, affect all the notes which follow on the ſame line or ſpace, throughout the whole tune, Art. 57.; ſo when either of them is occaſionally introduced in the middle of a tune, it is generally underſtood to affect all the notes which follow, on the ſame line or ſpace, in that bar of the muſic, but no farther; ſo that there is no need to repeat the character in the ſame bar, though the altered note ſhould occur more than once; but if another note ſhould follow in the ſame bar, on the ſame place with the altered note, and it be proper that the latter be reſtored to its natural place, it is neceſſary to contradict, or take off the effect of the ſharp, or the flat, which hath formerly taken place; and this we do by prefixing another character, called a *natural.* See Plate V. Ex. XXXVIII. with the following annotations.

203. ANNOTATIONS to Exam. XXXVIII.

This example conſiſts of a treble part, with a fundamental baſs ſubjoined; not with intent to be performed along with it, but only to ſhew the derivation of each paſſage in the upper part from the cadences which take place in this baſs. It is to be obſerved, that the mood of time is here ſextuple, or double-triple of crotchets in a bar, which is of the ſame nature as the ſimple triple, the bars being only put at the end of every two meaſures, Art. 85. This renders the middle of every bar accented in the ſame manner with the beginning, and conſequently gives us the opportunity of making two cadences in each bar, which are refered to by the letter H, I, K, *&c.* as before

At H, the treble aſcending from the 7th to the K, implies a regular cadence on the ſame K: but the diſſonant ſeventh muſt not be added to the leading chord, becauſe it is the beginning of the ſtrain, and therefore the firſt note, G, of the baſs bears only its own perfect chord, and needs not to be figured.

At I, the ſame cadence is again repreſented, though in a more vague manner, by the treble aſcending from the 2d to the 3d; this motion being only *accidental* in that cadence, whereas the other, at H, is *neceſſary*, Art. 196; and it is conſiſtent both with reaſon and experience, that the cadence be moſt plainly implied in ſuch paſſages as are moſt *eſſential* to it. In truth, this paſſage at I might have a different fundamental baſs applied to it, without any impropriety; but as we have yet ſpoke of nothing but regular cadences, we take this paſſage, at preſent, as belonging to a ſecond regular cadence on the K.

At K, the treble aſcends from the 3d upon the 4th. accented, which is one of the neceſſary motions in a regular cadence upon the ſame 4th, as *adjunct* to the principal key; and therefore ſuch a cadence muſt naturally take place here, as ſhewn in the ſubjoined baſs. For diſtinguiſhing the neceſſary motions in every cadence, it is to be obſerved that they always bear the ſame relations to the note on which the cadence is made, as they do to the K, in the cadence upon it, which we have formerly deſcribed; it is the very ſame circumſtance, *viz.* the *reſolution of a falſe fifth,* Art. 193. which renders theſe motions neceſſary in all ſuch cadences; and the falſe fifth being always between the third and the ſeventh of the leading chord, that third muſt aſcend by a ſtep of a ſemitone, and become the fundamental; and that ſeventh muſt deſcend one degree, and become the third, in the following chord: ſo that the neceſſary motions always lead to the fundamental and its third, *viz.* to the former by aſcending a ſemitone, and to the latter by deſcending either a ſemitone or a tone, as the ſcale allows. Thus in the cadence upon the adjunct 4th, ſuch as that now before us at K, the neceſſary motions are from the 3d to the 4th aſcending, as it is in the treble part here, and from the ♭ 7th to the 6th deſcending; which latter motion is ſeen in the treble at P; and though it does not appear here, yet it ought to be ſupplied by the accompanyment of the thorough-baſs. The exiſtence of the flat ſeventh in the leading chord, agreeable to what was obſerved, Art. 201. is ſhewn by the character prefixed to the figure 7, over the baſs note; it being neceſſary that the exiſtence of an altered note, when any ſuch takes place, either in the treble, or in any part of the accompanyment, ſhould be denoted by the manner of figuring the baſs; as we ſhall explain in courſe.

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* Notwithſtanding the above aſſertion, that *every occaſionally altered note will always be either the ſharp 4th, ſharp 5th, or flat 7th of the natural ſcale, which takes place at the time*, the reader need not to be alarmed at meeting ſometimes with the ſharp K, and even the ſharp 2d of the original ſcale, without any preparatory paſſages to denote the enterance of a *new key;* for, in theſe caſes, he may ſafely conclude, that the key is altered, be the tranſition ever ſo abrupt or unexpected. Some compoſers have endeavoured, by ſuch introductions, to give the hearers a *happy ſurprize*, but it ought to be done with great caution and ſkill.

At L, the treble aſcends from the ♯ 4th to the 5th, which repreſents a cadence upon the adjunct 5th, being a neceſſary motion in that cadence. The ſharp character is here occaſionally prefixed to the 4th of the treble, which now ſtands as a greater third, in the leading chord of the 2*f*, as obſerved, Art. 201. and this occaſional alteration of the third to the baſs note, is ſhewn, in the figuring, by the ſimple character placed above the note, it being underſtood that a ſharp, or flat, or natural, thus placed above a baſs-note, without any other figure following it, always refers to the third of the chord. The principal key-note itſelf becomes a ſeventh in this leading chord, in the accompanyment, and deſcends upon the 7th of the ſcale; which is the other neceſſary motion in this cadence.

At M, the treble deſcends from the natural 4th upon the 3d, which motion ſuggeſts a cadence upon the K: the natural character is prefixed to the 4th in the treble, to take off the effect of the ſharp which appeared in the former part of the bar; and the ſame character is alſo prefixed to the 7, in the figuring of the leading chord, becauſe the ſharp, which took place at L, proves to be the ſame degree with the ſeventh of this baſs-note.

At N, the treble aſcends from the ♯ 5th upon the 6th, thereby repreſenting a cadence upon the ſubſtituted 6th; the occaſional ſharp taking place in the treble, and alſo above the baſs-note, in the very ſame manner as at L, only one degree higher. This cadence differs from the others, in that the 2d of the ſcale, which here ſtands as a ſeventh to the 3*f*, in the leading chord, deſcends by a ſtep of a full tone upon the K, thereby making a leſs third to the 6*f*, in the following chord, whereas in all the other cadences the ſeventh of the leading chord deſcends only a ſemitone, and becomes a greater third in the following chord.

At O, the 5th is again made natural, and the treble takes the fundamental progreſſion of a cadence upon the K. Here, of neceſſity, the fundamental baſs takes the ſame notes with the treble, but the natural needs not be put before the baſs-note, becauſe the ſharp, which took place upon the ſame degree, in the former part of the bar, has not appeared in the baſs, but only in the figuring; and as theſe figures relate only to the upper parts, which are played with the right-hand, a change among the figures is not ſuppoſed to influence the following *real notes* of the baſs, which belong to the left-hand, in playing a key'd inſtrument.

At P, a cadence is made upon the 4th, as already obſerved, in ſpeaking of the paſſage at K.

At Q the treble moves from the 6th to the 7th, which is

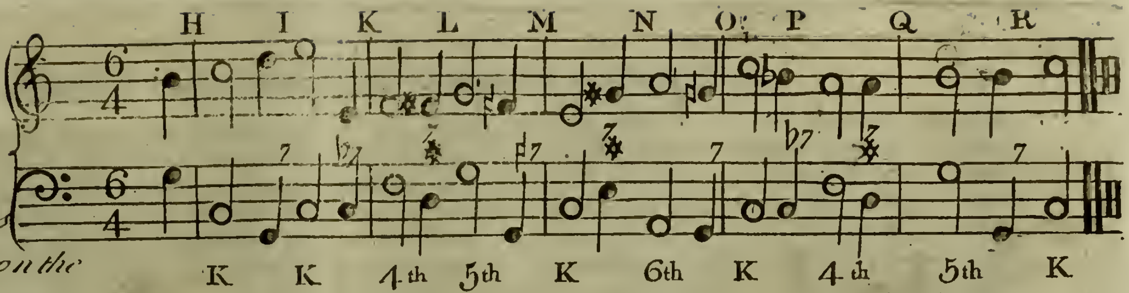
Plate V

Ex. XXXVIII

Occasionally altered Notes in the nat Scale of C

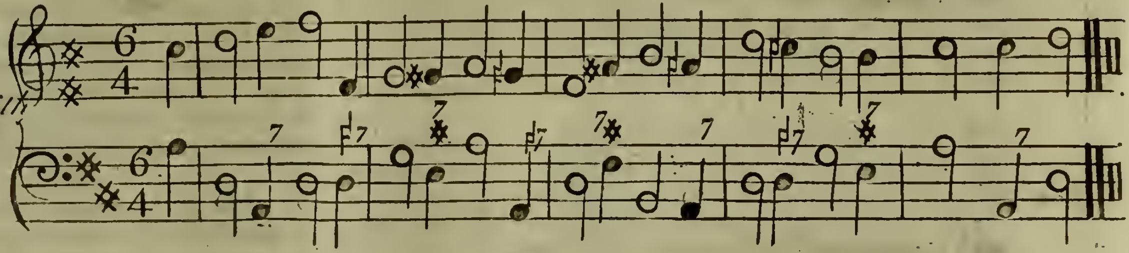
Fund Baſs

Reg Cadences on the



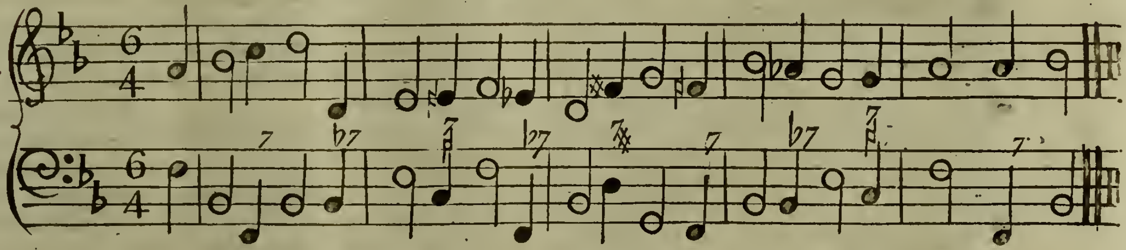
Ex. XXXIX

The same tranſposed with Sharps to the Scale of D



Ex. XL

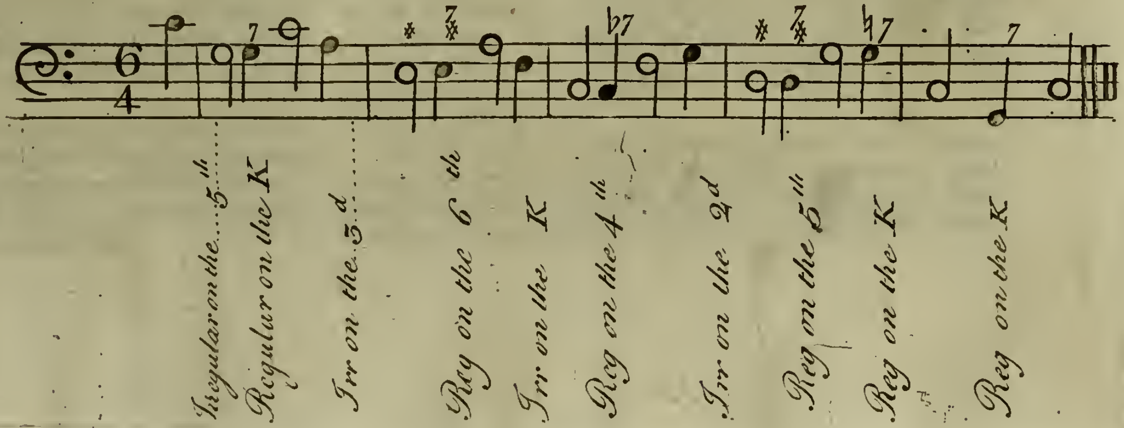
The same Tranſposed with flats to the Scale of Bb



Ex. XLI

Fund Baſs

Regular and irregular Cadences intermixed



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not a neceſſary motion in any cadence, but may accidentally repreſent a cadence upon the 5th, in the ſame manner as that at I, repreſented a cadence on the K, and for the ſame reaſon we here conſider it as part of ſuch a cadence. Here, though the 7th in the treble be reſtored to its natural place, which was affected with a flat, the laſt time it occurred, yet the interpoſition of the bar hinders that flat from affecting the preſent note, ſo that there is no occaſion for the natural character here; yet to prevent the miſtake which might otherwiſe happen, thro' the inadvertency of a performer, it is not amiſs to inſert the character in ſuch a place as this; and we often meet with inſtances, in the moſt correct pieces of muſic, of characters inſerted, where, according to the ſtricteſt rules, they might be left out.

The paſſage at R, makes the final cadence on the key.

204. When muſic is ſet in a tranſpoſed key with ſharps, as in Exam. XXXIX. the occaſional ♯4th, and ♯5th, are denoted in the ſame way as in the natural key; but the ♭7th is here made by rendering the 7th natural, which is originally ſharp at the cliff. So that here the flat character is ſupplied by the natural contradicting a ſharp at the cliff.

On the contrary, when muſic is ſet in a tranſpoſed key with flats, as in Exam. XL. the ♭7th is denoted the ſame way as in the natural key; but the ♯4th is expreſſed by rendering the 4th natural, which is originally flat at the cliff. The ♯5th, if there be no more than two flats at the cliff, will take its own proper character, as in Exam. XL. but if there be three or more flats at the cliff, the 5th of the ſcale will be one of the flat notes; and then the natural, contradicting a flat, muſt be uſed to expreſs the ♯5th alſo.

Upon the whole, it is to be remembered, that the true meaning of the natural character is ambiguous, and depends entirely upon what precedes it. *A natural, contradicting a flat, is to be looked upon as an occaſional ſharp: but when it contradicts a ſharp, it is, in effect, an occaſional flat.*

205. The reader will take notice that our chief deſign in the preceding part of this chapter has been to point out what motions in the treble are neceſſary in each regular cadence, and what are only accidental; and it is worth while to obſerve, upon the whole, that the aſcent or deſcent of a ſemitone, upon an accented part of the meaſure, always is, or may be, eſteemed a neceſſary motion in a regular cadence: the aſcent or deſcent of a full tone is never more than accidental in ſuch a cadence, except in the caſe of the 2d deſcending upon the K, in a cadence upon the 6th, as explained in ſpeaking of the paſſage at N.

It may not be improper to obſerve alſo that the example, above refered to, is very far from being a piece of good muſic, the treble part is but barely tolerable along with the baſs, and quite ſhocking when alone. To make good muſic there muſt be an agreeable variety of air and movement in the leading part, and at the ſame time a natural, eaſy ſucceſſion of chords in the thorough-baſs; the powers of *melody* and *harmony* muſt conſpire together for this purpoſe. Now, one of the principal requiſites in melody is *variety of diviſion*, which reſults from the breaking and ſubdividing the ſucceſſive bars or meaſures, in ſeveral different manners; of which the example before us is totally deſtitute; and in regard to the harmony, the attention is too much hurried from one cadence to another; we have no ſooner felt the cadence upon one key, than we are obliged to quit it, in order to purſue another, and this next juſt ſerves us the ſame way. This makes the ſucceſſion of chords ſeem wild and incoherent; and, inſtead of being pleaſed, we are rather puzzled to know what the ſounds mean, and how to reconcile them one with another.

In order to obtain a more connected ſucceſſion of chords, and yet not wanting variety, it is neceſſary to admit of other kinds of cadences, beſides the perfect, already deſcribed, ſome of which ſerve to ſuſpend, and ſome to diſappoint the natural expectation of the ear, ſo as not to ſuffer our attention perfectly to ſettle, either upon the principal key, or any other, until ſome certain *phraſe* or *ſtrain* of the tune, Art. 103. be finiſhed; or until the ſenſe of the words, ſet to muſic, may properly admit of a reſt or pauſe.

206. The attention is kept in ſuſpence, by the cadence uſually called *irregular*, which is juſt *the regular cadence reverſed*; *viz.* the chord of the K, preceding or leading into that of the 5th, inſtead of the 5*f*, leading to the K*f*, as in the regular cadence: and it is known by the fundamental baſs riſing a fifth, or falling a fourth, upon an accented part of the meaſure.

In this irregular cadence the diſſonant ſeventh muſt not be added to the chord of the 5th, now uſed as a following chord, becauſe the proper uſe of diſſonances, in all caſes, is to excite an expectation of another chord to follow, in which the diſſonance ſhall be heard reſolved, Art. 196. But here we are ſuppoſed to bring the harmony to a kind of pauſe, though not to a full concluſion; ſo that a diſſonance may here be more properly added to the chord of the K, now uſed as a leading chord: and the proper diſſonance for this purpoſe is the added ſixth; of which we ſhall ſpeak below.

207. The regular cadence takes place occaſionally upon the ſame degrees of the ſcale, which are capable of leading in a regular cadence, as ſhewn above: ſo that as we have four regular, we have alſo four irregular cadences, repreſented, Exam. XLI. where each irregular cadence is ſo placed as to precede immediately the regular from whence it is derived. In this example the notes which form the irregular cadences bear only their perfect chords, in which caſe there is not any motion in the upper parts which can properly be called *neceſſary*, becauſe there is no diſcord to be reſolved; and therefore we have put no treble part above the fundamental baſs.

208. The added ſixth in the leading chord of an irregular cadence is brought in by intermixing the irregular and a part of the regular cadences together, in paſſing upon the K, or the 5th: as both of theſe notes may be introduced by either kind of cadence. Thus the paſſage at I, in Exam. XXXVIII. which we there take as part of a regular cadence on the K, Art. 203. might be admitted in the treble, at the ſame time that the fundamental baſs paſſes, by the irregular cadence, from the 4th upon the K; and the paſſage at Q, in the ſame example, might take place, while the fundamental baſs paſſes, by the irregular cadence, from the K upon the 5th. In both theſe caſes the former notes of the treble would become added ſixths in the leading chords, and aſcend by one degree upon the third of the following chords; and this motion is the proper reſolution of the diſcord in the irregular cadence: we ſhall give examples hereafter.

209. The *falſe cadence* is a regular cadence *diſappointed*, by the fundamental baſs aſcending only one degree, inſtead of a fourth, and thereby introducing a fundamental note, a third below that which would have taken place, if the falſe cadence had not been admitted.

This paſſage is properly a *gradation* or *ſtepping* from the leading chord of a regular cadence, upon the degree next above, and is chiefly practiſed from the K upon the 2d, in place of the regular cadence on the 4th; and from the 5th upon the 6th, in place of the regular cadence on the K. The leading chord in this falſe cadence, or *gradation*, may bear an added ſeventh, the ſame as in the regular cadence; becauſe the neceſſary motions which reſolve the diſcord, as ſhewn above, may in this caſe be uſed, as they lead to the third and fifth of the following chord.

210. The ſame kind of gradation from the chord of the 4th*f*, upon that of the 5th, is often uſed in bringing the harmony to a kind of *imperfect pauſe*, or reſt, on the chord of the 5th: but although this paſſage is very frequently found in our muſic, yet it has not been ranked among the claſs of cadences, by the wri-

ters on this ſubject, and therefore we ſhall not preſume to make innovations in this reſpect, but ſhall give it the title which firſt occurred, of a *gradation on the 5th.*

211. In this paſſage, the leading chord of the 4th *f* may take an added ſixth, after the ſame manner as in the irregular cadence on the K, mentioned, Art 108; but with this difference in the movement of the upper parts, in order to form the following chord, *viz.* here the 2d of the ſcale, which makes the added ſixth, muſt keep its place, and become a fifth; and the K muſt deſcend, and become a third, in the following chord; as repreſented at I, in Exam. XLII. Plate VI: whereas in the irregular cadence on the K, the 2d aſcends upon the 3d, while the K keeps its place, and becomes the fundamental, as ſhewn at H, in the ſame example.

The reader will obſerve, that this example is in the ſcale of G, with a ſharp upon F, at the cliff, and that the treble takes one of the abovementioned movements, while the other is ſhewn by directs: and it is uſeful to remember, that in both theſe paſſages, the diſcordant interval, which exiſts between the 2d of the ſcale and the K (ſtanding as ſixth and fifth in the leading chord) is reſolved *by one of its terms moving a ſtep farther from the other;* and, in both paſſages, the moving term makes the third in the following chord: and that whenever the fundamental bears an added ſixth, one or the other of theſe motions becomes *neceſſary,* for the reſolution of the diſcord.

212. To account for this *double uſage* * of the chord of the 4*f*, with an added ſixth, it may be obſerved, that this chord has an *ambiguous,* or *double fundamental,* as ſhewn, Art. 178. and Exam. XXXVI. Our attention is divided between the 4th of the ſcale, and the 2d; and in paſſing from this chord upon the K, by the irregular cadence, our principal regard is placed upon the 4th: but in making a gradation upon the 5th, our attention is rather turned to the 2d; which, as we have formerly ſeen, ought to precede the 5th, in a regular cadence. A direct is placed at I, in Exam. XLII. upon the 2d, in the fundamental baſs, to exemplify this matter.

There are other ways of diſappointing both the regular and irregular cadences, but being very ſeldom admitted at the concluſion of a phraſe, where a formal cadence is expected, we ſhall paſs them over at preſent.

213. To make an end of this diſquiſition concerning cadences, let the following account of all the fundamental paſſages, which have already been explained, be well obſerved.

From the K *f*, as a leading chord, we can make an irregular cadence on the 5th, a regular cadence on the 4th, or a falſe cadence on the 2d, of the ſcale.

From the 5th *f*, as a leading chord, we can make a regular cadence on the K, an irregular cadence on the 2d, or a falſe cadence on the 6th.

From the 4th *f*, as a leading chord, we can make an irregular cadence on the K, or a gradation on the 5th.

From the 2d *f*, we may make a regular cadence on the 5th.

From the 6th *f*, we may make an irregular cadence on the 3d

From the 3d *f*, we may make a regular cadence on the 6th, or a falſe cadence on the 4th.

In every regular and falſe cadence the proper diſcord in the leading chord is the added ſeventh; and in the irregular cadence and gradation, the added ſixth: yet theſe added diſcords may be left out, and in many caſes it is neceſſary to do ſo; of which hereafter.

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* This liberty of uſing the chord of the 4*f*, with an added ſixth, either as leading to the K *f*, or the 5 *f*, is called, by the French theoriſts, *le double emploi de la diſſonance.*

If theſe paſſages be well remembered, we ſhall have little further difficulty in aſſigning the proper fundamental progreſſions for the beginnings and middle parts of harmonic phraſes, where no formal cadence is expected.

214. In an harmonic phraſe it is moſt natural to diſpoſe the ſucceſſive chords ſo, that every fundamental paſſage from one chord to another, may be an *imitation* of ſome of the above deſcribed cadences; eſpecially the paſſages from an unaccented to an accented note; as from the end of one bar or meaſure to the beginning of the next: and ſuch diſpoſitions become the more neceſſary as the movement is ſlower. In the common pſalm tunes, for inſtance, there is ordinarily a cadence imitated at every bar; and theſe *imitations* are often introduced, without altering any of the degrees of the ſcale, although ſome occaſional alteration would be neceſſary to make the cadence perfect in its kind. Thus the paſſage from the 3d *f* to the 6th accented, or from the 6th to the 3d accented, is often admitted without altering the 5th; though the former imitates a regular, and the latter an irregular cadence, in both of which the ※ 5th is an eſſential note. Art. 201, and 207. The ſame liberty may be uſed in other imitations, as we ſhall ſee below.

215. The movement of the fundamental baſs is leſs reſtricted, in paſſing from an accented to an unaccented note; and eſpecially after a cadence has been heard upon the former, becauſe then the harmony is brought to a kind of pauſe, and we are not much concerned about the connexion; yet even in theſe caſes there are ſeveral cautions neceſſary, in order to produce an agreeable effect, which we ſhall endeavour to explain in courſe. It will not be diſagreeable to the reader, in the mean time, to ſee a little of the *application* of what is already ſaid, in ſome familiar examples. We ſhall begin with the fundamental of the natural ſcale aſcending and deſcending, as repreſented in the latter part of Exam. XLII.

216. The natural ſcale, conſiſting of eight ſucceſſive ſounds, when performed in a ſlow manner, as denoted by the minims, divides into two phraſes of four ſounds each, both aſcending and deſcending, as ſhewn by the dotts in this example: and the expectation of cadences falls particularly upon the concluſion of each of theſe phraſes, which we here refer to, by the letters K, L, M, N.

Each of the phraſes in this example ends with a regular cadence, *viz.*

At K, a regular cadence is made on the adjunct 4th;
At L, the ſame is made on the principal key;
At M, the ſame is made on the adjunct 5th;
At N, the final cadence is made on the key:

and it is plain, from what is formerly laid down, that the cadences at K and L are implied in the motion of the treble, and that at N is neceſſary for making a concluſion: but it remains to be ſhewn, why the paſſage in the treble, from the 6th upon the 5th of the ſcale, at M, could not with equal propriety have been refered to an irregular cadence upon the K; as, by ſo doing, the enterance of the altered note in the accompanyment, denoted by the ※ in the figuring, would have been prevented, and, of conſequence, the original key more ſtrictly retained. For this purpoſe we may obſerve, according to Art. 213 and 214. that every fundamental paſſage in this example *imitates* ſome cadence; as will eaſily appear upon the ſlighteſt examination: and although this reſtriction is not always indiſpenſible, yet, in general, the leſs we deviate from it, the more eaſy and natural is the ſucceſſion. Now, having paſſed, in imitation of the irregular cadence, from the K*f*, upon the 5th*f*, at the two firſt notes of the phraſe M, we cannot take the 4th for the next fundamental note, in order to form the irregular cadence on the K, without deſtroying the connexion; as the paſſage from the 5th*f* to the 4th*f*, does not repreſent any cadence.

But this is not all; for there are other reaſons why the 5th muſt not be followed by the 4th in the fundamental baſs, of which we ſhall ſpeak hereafter.

It is on the ſame account, that we refer the deſcent from the 4th upon the 3d of the ſcale, at the beginning of the next phraſe N, to a regular cadence on the K, wherein the 4th becomes a ſeventh in the leading chord of the 5th *f*, rather than to an irregular cadence on the K, wherein the 4th might have been the leading fundamental. This latter would have introduced more variety, and therefore have been more eligible, had not the preceding chord of the 5th *f* at M, prevented its admiſſion. The next example XLIII, will ſufficiently illuſtrate this matter.

217. This example conſiſts of phraſes of ſix notes in each, and the expectation of cadences falls upon the two laſt notes in each phraſe, as ſhewn by the ſubjoined letters O, P, Q, R.

The paſſage in the treble, from the 3d to the 4th, in the phraſe O, which naturally repreſents a regular cadence on the ſame 4th *f*, as at K, is here diſappointed, by introducing, in the baſs, an imitation of the falſe cadence on the 2d; and, by this means, the 2d is brought in as leading to the 5th *f*, at the concluſion of this phraſe, which is the moſt eligible baſs, as it imitates a regular cadence on the 5th; although the cadence is *imperfect* in regard to the treble, becauſe the 4th is not made ſharp. In truth, this paſſage is a mixture of two fundamental progreſſions, the baſs moving by the regular cadence, while the treble makes a gradation on the 5th, and the leading chord has a double fundamental, as ſhewn by the direct.

The diligent reader will probably have obſerved, that the ſame double fundamental is alſo repreſented in the phraſe L, and a queſtion may occur, which it will be very proper to anſwer, before we proceed, *viz.* Why is the 4th repreſented as a governing fundamental at L, and the 2d at O; for, in either paſſage, any of the two is allowable, according to the rules already laid down? For anſwer, let it be obſerved, that this ought to be the caſe, whenever diſſonant chords of an ambiguous fundamental are introduced, as hinted, Art. 187. and to account for the preference due to one of theſe fundamentals, rather than the other, in the two caſes now before us, we muſt further obſerve, that a *conſecution* of perfect concords, *viz.* octaves or fifths, between the treble and the fundamental baſs ought to be avoided, when it can be done, without tranſgreſſing other rules. Now, had the 2d *f* taken place at L, there would have been two *conſecutive* fifths, at the paſſage from the K to the 2d *f*; and if the 4th *f* had taken place at O, there would have been two conſecutive octaves, at the paſſage from it to the 5th *f*.

There is a ſort of dryneſs, and want of variety, in ſuch conſecutions, which renders it neceſſary to avoid them, as much as poſſible.

The firſt four notes of the phraſe P, are accompanied the ſame way as at L, but the laſt two are here taken as part of a regular cadence on the 5th, in which the K in the treble becomes a ſeventh in the leading chord, and deſcends upon the 7th of the ſcale, now taken as a third in the following chord. The irregular cadence might have been uſed in this paſſage, the ſame way as at the beginning of the phraſe M; but the regular is preferable, becauſe it is better to vary the harmony, upon the repetition of the ſame note in the treble, where it can conveniently be done: and if the irregular cadence had been uſed at the concluſion of this phraſe, the two ſucceſſive K's, in the treble, muſt have been both refered to the K *f*.

The phraſe Q ends with a cadence on the 4th, which obliges us to take the preceding 5th, in the treble, as belonging to the K *f*: and in order to do this, we muſt not refer the 6th, which goes before it to the 2d *f*, as at M, becauſe the deſcent, from the 2d to the K, could not be allowed in the fundamental baſs, in this place, and therefore we here make the 6th itſelf a fundamental, by means of the falſe cadence. And although the paſſage, from this 6th to the K, does not imitate any cadence, yet it is allowable here, becauſe of the divided attention which the falſe cadence creates; as ſhewn by the direct, aded in this place. In truth, the attention may at any time be ſuppoſed to be divided between the fundamental, which would naturally have taken place, and that which is introduced, partly unexpected, by the falſe cadence, Art. 209. and it is of conſequence to obſerve, that immediately after any ſuch falſe cadence, we may proceed, if it be convenient, in the very ſame manner as if the regular cadence had not been interrupted at all.

At the beginning of the next phraſe R, the ſame 6th is refered to the 4th *f*. The 5th and 4th are taken as at Q, and the 3d, 2d, and K are uſed as at N; which finiſhes the ſtrain.

It is expected, that the reader will carefully obſerve theſe different uſages of the ſame note in different occurrences; and that, if he finds his ideas of theſe matters any way confuſed, he will not only take the trouble of reading over again, from Art 206. but alſo of copying carefully the ſcale and the Exam. XLIII. with his own hand; which, if he neglects to do, and attempts to proceed without a pretty clear knowlege of what is paſt, let him not blame the author for writing unintelligibly, if he ſhould find himſelf bewildered hereafter.

218. Hitherto we have ſeen the treble moving only by ſingle degrees; the Exam XLIV. which is the fundamental of York tune, ſhews a little of the manner of proceeding when the treble moves by leaps. This, and all other common meaſure pſalm-tunes, being ſtrains of 8 and of 6 ſyllables alternately, the expectation of cadences falls upon the middle of the firſt and third lines, and at the end of every line, as ſhewn by the letters S. T. U. W. X. Y.

It is allowable, when the treble moves by leaps, to continue the ſame fundamental through a whole bar, if the notes of the treble will admit of it, as is frequently done in this example; but it is better that a new chord ſucceed at the beginning of the next bar, when it can properly be introduced.

At T and at X the fundamental baſs is made to aſcend, by taking the leading note an octave below that which went before it, in order to help the two conſecutive fifths, between the baſs and treble, becauſe the *contrary motion* partly compenſates for the want of variety in ſuch paſſages; but it would be ſtill better if the courſe of the treble were altered, ſo as to avoid the conſecution.

At U there is a conſecution of octaves, which is remedied in the ſame mannner by contrary motion; but in this place we commonly ſee the ✻ 4th, in the place of the 2d, in the treble, which is better.

219. Before we quit the examples now under conſideration, it will not be improper to ſhew why ſeveral omiſſions take place in the figuring of theſe baſſes, which have not yet been explained.

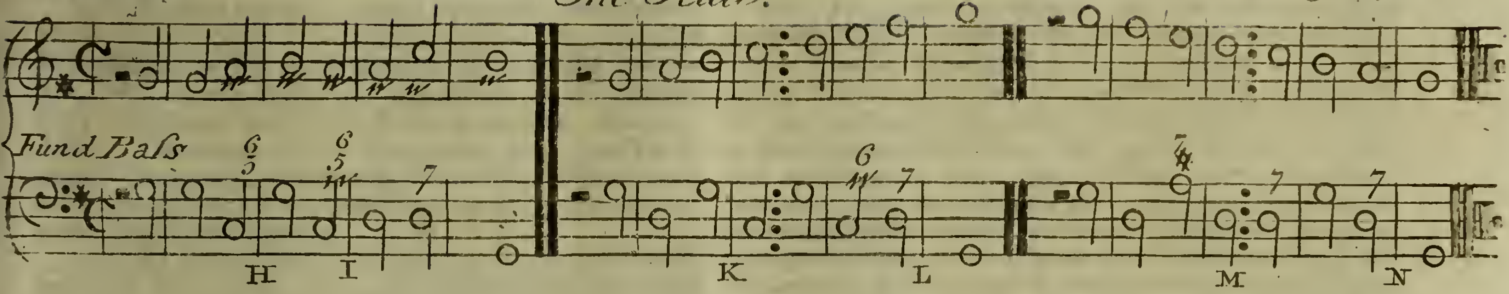
At K the leading chord of the regular cadence on the 4th is left without an added ſeventh; but at S and W the ſeventh is added: and to account for this it muſt be obſerved, that the ♭ 7th of the ſcale ought not to take place in a chord, when the natural 7th has been heard in the chord immediately preceding; becauſe the paſſage from the natural to the ♭ 7th is diſagreeable or *inharmonical*. The ſame may be obſerved of the paſſages from the ✻ 4th to the natural 4th, and from the ✻ 5th to the natural 5th. Now, in the phraſe K, the natural 7th has been heard as a greater third to the 5th *f*, in the chord preceding the cadence; but at S and W it has not been heard.

The ſeventh is not added to the firſt note of the phraſe L, both becauſe a formal cadence is not here expected, and alſo becauſe ſuch a ſeventh muſt have deſcended, and met the treble upon the 6th of the ſcale, which 6th being employed as a third, to the following fundamental, ought not to be doubled.

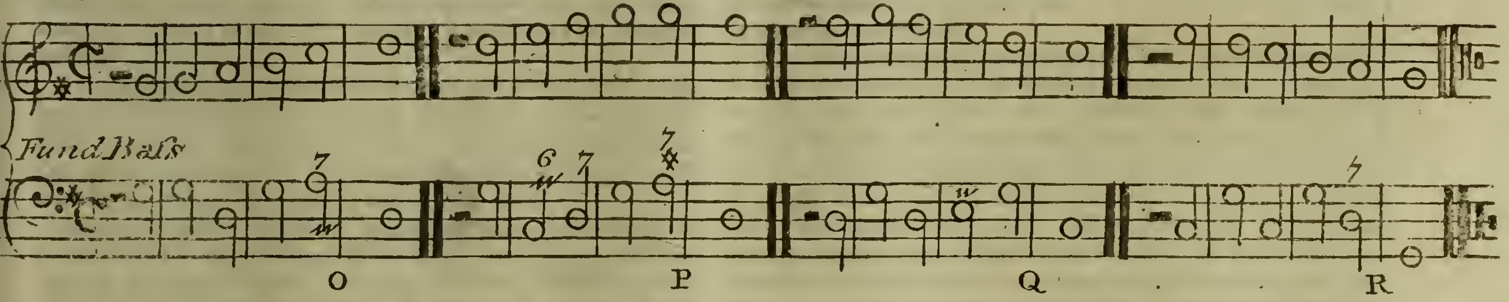
Plate VI

Ex XLII.

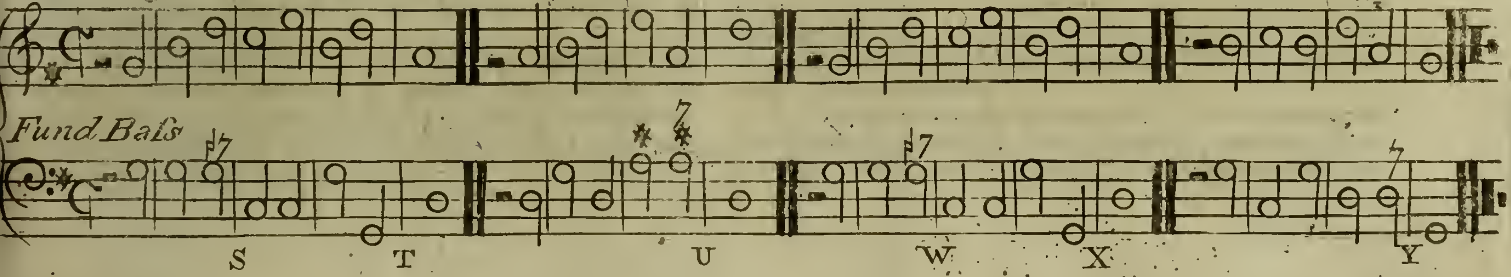
The Scale.



Ex XLIII



Ex XLIV *York Tune.*



At Q the ſame ſeventh is omitted for no other reaſon but to prevent the cadence from being too concluſive; for it requires ſome ſkill and caution in the uſe of the regular cadence on the 4th, leſt it ſhould deſtroy the expectation of the principal key; and there is leſs hazard of this in the other regular cadences. One reaſon is, that the principal key, though it be retained in memory, yet reconciles itſelf to our imagination, as a fifth to the 4th*f*; if the cadence on the 4th be too formally made, or too often repeated.

At T and X the ſixth is not added to the chord of the K, leading in the irregular cadence, becauſe that ſixth, joined with the 5th of the ſcale, muſt have aſcended to the ſeventh, while the 5th had kept its place; but here the 5th does not keep its place, but deſcends upon the 2d, in the treble part, and therefore the diſcord is omitted, becauſe it could not be properly reſolved.

In the phraſe Q the ſeventh is not added to the 5th*f*, leading in a falſe cadence on the 6th, becauſe the treble deſcends from the 7th to the 6th of the ſcale, whereas the addition of the 4th of the ſcale, as a ſeventh to the leading chord, would require the 7th of the ſcale to aſcend into the K.

In the phraſe L, the 4th*f*, which precedes the cadence, is figured with 6 only, inſtead of 6 and 5, as at I; the fifth being left out in this chord; becauſe, if it were admitted, along with the ſixth, it muſt neceſſarily deſcend upon the 7th of the ſcale, but the treble aſcends upon the ſame 7th, and therefore this omiſſion takes place here, to prevent the neceſſity of doubling the 7th. The ſame is to be obſerved of the 4th*f*, in the phraſe P.

In the phraſes R. T. X. and Y. the 4th *f*, leading in the irregular cadence, bears only its perfect chord, without the added ſixth, as at H: becauſe, in theſe paſſages, the treble deſcends upon the 3d of the ſcale, and if the added ſixth were uſed, it muſt aſcend upon the ſame 3d.

220. To ſupport the aſſertion, that not only ſuch as are complete judges of harmony, but even all who have any enjoyment of muſic, although they be quite ignorant of its principles, do naturally conceive the ſucceſſive ſounds as belonging to ſome fundamental progreſſion, we may obſerve, that while a man of a good *natural turn* for muſic, without any farther acquirements, ſings a tune, ſhould another ſupply the proper fundamental of each ſound, as a baſs, the ſinger would immediately find additional pleaſure ariſing from the perception of the harmonious relations between his ſounds and this baſs; he would be able to attend to this baſs without any hazard of loſing, or *being put out of* his tune; on the contrary, ſuch ſubjoined ſounds would rather ſupport and guide him to a more juſt performance of his own part. Theſe are facts ſufficiently atteſted by experience.

221. If an objector ſhould ſay, "I can ſing ſeveral tunes as
" well as one of you who underſtand muſic, and I know no-
" thing about it, neither am I ſenſible of any regard paid to
" any other ſounds, except thoſe of the tune, as they ſucceed
" one another; what influence then can theſe other ſounds you
" call *fundamentals* have upon my voice?" Our anſwer is, that their influence may take place, juſt as effectually, when we are not apprized of it, as when we are; there are numbers of *cuſtomary operations*, both of mind and body, which we perform, without ever ſtudying the philoſophical principles of the matter. Thus we ſtand and walk, *&c.* without any knowlege of the laws of gravity and motion; we converſe in our mother-tongue, without ſtudying grammar; argue, without underſtanding logic, *&c.*; and thus we ſing, in conformity to certain fundamental progreſſions, even although we are quite inſenſible of their influence.

222. By comparing the various effects of the ſounds of the natural ſcale, as mentioned, Art. 21 and 22, and the properties of ſounds conceived as parts of ſome fundamental chord,

Art. 141, with the examples laſt adduced, we ſhall find abundant reaſon to conclude, that every ſinger who perceives thoſe effects, does really, in ſome degree, adopt a fundamental progreſſion. Thus, we ſee, in Exam. XLII. that the key-note of the natural ſcale has its own ※P chord, and that the 5th of the ſcale ſtands as a fifth in the chord of the K*f*, in aſcending, and has its own ※P chord, in deſcending; and that the 3d and 7th of the ſcale ſtand as greater thirds in the ※P chords of the K and of the 5th reſpectively, both aſcending and deſcending: now, it was obſerved, Art. 141. that the fundamental of a ※P chord, is bold and commanding, and its third ſupplicative; and from hence we may ſafely infer, that the *bold* effect of the K, and of the 5th, and the *ſupplicative* effect of the 3d and 7th, as hinted, Art. 21, depend altogether upon the fundamental progreſſion. The *plaintive* effect of the 2d and 6th, mentioned in the ſame Art. 21. is moſt perceivable when either of theſe ſounds becomes a fundamental, bearing a ♭P chord, agreeable to Art. 141.; and the 4th is moſt remarkably *heavy and ſpiritleſs* when it ſtands as an added ſeventh in the ※P chord of the 5th*f*, or as a leſs third in the ♭P chord of the 2d*f*: but even in other paſſages, if the principal key be retained, theſe notes ſtill keep ſomewhat of the ſame properties. Thus the 4th has a peculiar *gravity* or *ſolemnity*, even when it becomes a fundamental, as in the aſcending ſcale; and the 6th is, in ſome meaſure, *plaintive*, even when it ſtands as a greater third in the ※P chord of the 4th*f*, or as a fifth in the chord of the 2d*f*.

223. Another obſervation, which will frequently preſent itſelf to all ſuch as are engaged in teaching beginners to ſing, tends directly to the confirmation of theſe principles. It will often happen, that before a perſon begins to apply himſelf profeſſedly to learn to ſing, he will have partly got ſeveral tunes by the ear, in ſome paſſages of which it is ten to one that he will ſing falſe; either copying the errors of thoſe whom he has been accuſtomed to hear, or running into others of his own, through the imperfection of his memory; and if his erroneous notes be ſuch as require a fundamental ſucceſſion different from the real tune, it is with the greateſt difficulty he can be brought to correct them; but if the fundamental ſucceſſion be the ſame, he will ſing the right notes at the firſt trial, juſt as eaſily as the wrong.

The difficulty of correcting the errors of ſuch an *untaught* ſinger is yet more increaſed, if his falſe notes belong to a more eaſy fundamental ſucceſſion, than the true ones; which often happens. For inſtance, a whole congregation will very frequenly conclude a line of a pſalm-tune, by aſcending from the 7th to the K, when the real tune deſcends from the K to the 7th; and in this caſe the wrong notes ſuggeſt a regular cadence on the K, and the right notes belong to a cadence on the 5th; and it is next to an impoſſibility to correct this fault; for the regular cadence is ſo natural in itſelf, and ſo intimately connected with that part of the tune, according to their way, that nothing elſe will ſatisfy them in its place. You may eaſily bring them to uſe the 5th in place of the 7th, or to take any of the other motions which repreſent the ſame cadence; but nothing will be reliſhed which cannot be reconciled to that *favourite paſſage.*

224. Upon theſe principles we may give a rational account of the various taſtes of perſons who have a natural turn for muſic, but unimproved by practice. Such perſons adopt, and become familiarized with ſome fundamental paſſages, which correſpond with the favourite tunes they are accuſtomed to hear; and when a new tune preſents itſelf, which can eaſily be reconciled with their *favourite fundamental paſſages*, they are immediately pleaſed; but if this cannot be done, they are perplexed and diſguſted: though, at the ſame time, perhaps the real fundamental ſucceſſion of ſuch a tune may be quite eaſy and natural in itſelf, and ſufficiently obvious to another hearer.

Hence we may alſo aſſign the reaſon, why ſo very few of the more unſkilful ſort are delighted with a new tune at the firſt hearing, and why it becomes more agreeable after ſeveral repetitions, when they begin to *know the air of it*: for, in truth, the proper effect of every ſucceſſive ſound, which has a conſiderable influence in the *air* of a tune, depends upon the fundamental progreſſion; and this is not always ſo infallibly ſuggeſted at once, to an unexperienced hearer, but that his firſt conceptions are either vague and undetermined, or perhaps erroneous and inconſiſtent with the true air of the tune; and therefore need to be re-examined and corrected by frequent trials, before he can ſufficiently rely on them.

The more expert muſician is ſeldom at any loſs for a proper fundamental progreſſion, and therefore enters immediately into *the ſpirit* of any new piece which occurs. Monſieur *Rameau* undoubtedly ſpeaks from experience when he ſays, in his *Principles of compoſition*, that a man may *feel* the baſs which ought to go along with the treble, while the latter is performed ſingly without any accompanyment: and this proficiency is the very *maſter piece* of the ſkill of muſic; which, however rare, is nevertheleſs, in ſome degree attainable, by all who have a natural taſte, if its principles be duly attended to, in the courſe of practice.

225. The moſt natural and eaſy ſucceſſions of ſounds, for the human voice, are thoſe which aſcend or deſcend by the ſingle degrees of the ſcale, and not by leaps: and hence it follows, that theſe ſucceſſions ſoon become familiar to every one, who either practiſes or hears vocal muſic; and, of courſe, the fundamental paſſages belonging to ſuch ſucceſſions, become equally familiar; though, perhaps, the ſinger is quite inſenſible of them. This remark may ſerve to prove the uſefulneſs and neceſſity of a thorough knowlege of the proper fundamental progreſſions, while the treble moves by ſingle degrees only; becauſe ſuch progreſſions cannot fail of being obvious, to every hearer, for the abovementioned reaſons.

226. We ſhall now proceed to the explanation of ſome other paſſages which are allowable in fundamental baſſes.

Although thoſe fundamental paſſages which *imitate* the cadences, as explained above, are generally the moſt natural, yet the ſucceſſion of chords is not ſo ſtrictly limited, but that, where a formal cadence is not expected, and if neither diſſonances nor occaſionally altered notes be introduced; that is, if every ſucceſſive fundamental bear only its own perfect chord, ſuch as the ſcale allows, we may freely paſs from any one chord to any other, provided there be one ſound common to both; which, by continuing upon the ſame degree, *connects* the two ſucceſſive chords; and ſuch a ſound is called, by the artiſts, a *holding note*.

Conformable to this principle of *connexion by a holding note*, it is plain, that the fundamental baſs may either aſcend or deſcend by a leap of a ſixth, or fifth, or fourth, or third; provided it does not touch the 7th of the ſcale; or, which is the ſame thing, the fundamental baſs may move by leaps of any kind, but not by ſingle degrees; becauſe in all leaps, there will, at leaſt, be one holding note to connect the following with the preceding chord.—If the fundamental baſs riſe a third, or fall a ſixth, the third and fifth of the preceding chord will be both continued, and become the fundamental and third in that which follows: if the fundamental baſs riſe a fourth, or fall a fifth, the octave of the former fundamental is held on, and becomes a fifth to the latter: if the fundamental baſs riſe a fifth, or fall a fourth, the fifth of the former chord is held on, and becomes a fundamental: and if the fundamental baſs riſe a ſixth, or fall a third, the octave and third of the former fundamental are both held on, and become third and fifth to the latter.

227. This idea of the connexion of chords is well worthy of the learner's notice, although it is not a ſufficient foundation for a ſatisfactory account of all the fundamental progreſſions which are prefered in practice; becauſe we often paſs from one chord to another when there is no holding note, as in the falſe cadence; and even when there are holding notes, thoſe chords are found to be nearer related which have but one, as when the fundamental baſs riſes or falls a fifth, than thoſe which have two, as when the fundamental baſs riſes or falls a third; contrary to what might be expected, if the holding note were the ſole cauſe of the connexion. Beſides, in many paſſages, and particularly in the perfect regular cadence, it is a matter of indifference whether the 5th of the ſcale, which is the holding note, be heard at all in the following chord, or not. See Art. 192. And if the connexion of the two chords, which form this cadence, were owing to this holding note, its exiſtence in the accompanyment might ſeem to be more neceſſary. For theſe and other reaſons we have concluded it more proper to repreſent the *imitation of cadences* as the moſt natural law of fundamental progreſſions, in preference to the connexion by holding notes; as this latter may be ſufficient in the middle parts of a phraſe, but is a circumſtance of little or no importance in a cadence.

228. We account, then, every leap of a fourth or fifth, in the baſs, to be an imitation of a regular or irregular cadence: the leap of a third or ſixth is allowed, by reaſon of the holding notes: the riſing of a ſecond imitates the falſe cadence or gradation; and the falling of a ſecond, which occurs more rarely than any of the former *, may be admitted only after a chord of an ambiguous or double fundamental, or after an occaſionally altered note has taken place, as we have now to explain.

229. It was formerly hinted, Art. 217. in ſpeaking of the phraſe Q, that immediately after the falſe cadence has been uſed we may proceed, in the ſame manner as if the regular cadence had not been interrupted at all. Hence it follows, that after the 6th has been introduced in the fundamental baſs, by means of the falſe cadence, we may immediately deſcend to the 5th*f*, becauſe the paſſage from the K, which in this caſe claims a part of our attention, upon the ſame 5th, is very natural. We muſt obſerve farther, that ſo long as we ſtrictly retain the principal key, the chords of that key, and of its two *adjuncts*, will be ſo ready to preſent themſelves to our imagination, on all occaſions, that whenever the chord of the 6th*f* is brought in, either by means of the falſe cadence, or otherwiſe, the chord of the K*f* will in ſome degree attract our attention as co-exiſting along with it. In the ſame manner the chord of the 5th*f* will claim a part of our regard along with that of the 3d*f*, when the 5th is not occaſionally ſharpened. And the chord of the 4th*f* will be felt along with that of the 2d*f*, when the 4th is not occaſionally ſharpened. — So that in fact we have frequently chords of a double fundamental, when no diſſonances are heard, owing to a natural propenſity of reconciling every ſound we hear to one or another of theſe three principal chords, *viz.* to the chord of the K*f*, or to that of the 5th*f*, or that of the 4th*f*.

From hence it follows, that as the fundamental baſs may deſcend from the 6th to the 5th, on account of the ambiguous fundamental of the former chord; ſo, by parity of reaſon, it may alſo occaſionally deſcend from the 2d to the K, or from the 3d to the 2d, if the accidental ſharp note do not take place in the former chords of ſuch paſſages: and it is not difficult to meet with examples of each of theſe progreſſions among the works of the very beſt compoſers. In like manner, the gradual deſcent from the 4th *f* to the 3d *f*, is allowed in paſſages where the 6th may be ſuppoſed to attract part of our attention as a fundamental, along with the 4th; which never fails to happen in the following chord of a falſe cadence on the 4th, and in ſome other caſes; ſo that, in fact, *the fundamental baſs may occaſionally make a gradual deſcent, in the middle of one connected ſtrain, from any note except the K, and the 5th.* From the K, ſuch a deſcent cannot be allowed, becauſe the 7th cannot be a fundamental; and from the 5th ſuch a deſcent cauſes an interruption, or *breach*, in the harmony; becauſe, according to the above principles, the connection in ſuch paſſages is owing to the third note in the former chord being taken as a co-exiſtent fundamental; which third being, in this caſe, the 7th of the ſcale, cannot be admitted as ſuch.

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* Monſieur *D'Alembert*, in his *Elemens de Muſique*, concludes the falling of a ſecond to be diſallowed in a fundamental baſs on any occaſion: but we beg leave to diſſent from him in this particular; for reaſons which will probably appear ſufficient.

In Exam. XLV. Plate VII. are introduced inſtances of each of theſe deſcents, marked by the ſtars; which example, as far as it relates to this article, needs no other annotation, but that the directs, placed in the baſs, ſhew the co-exiſtent fundamentals, by means of which ſuch deſcents are allowed.

230. In regard to the liberties which may be allowed in a fundamental baſs, when occaſionally altered notes take place in the accompanyment, we muſt obſerve, that ſuch notes being more diſtantly related to the principal key, and therefore more difficult both for the finger to execute, and for the hearer to reliſh, do naturally require to be followed by the next neareſt degree of the ſcale, as a kind of *reſolution* of the diſcord between them and the principal key; whatever be the fundamental of the chord for the time. Thus the ※ 4th naturally tends to the 5th, the ※ 5th to the 6th, and the ♭ 7th to the 6th of the ſcale: and the deſire of hearing ſuch notes properly followed is ſometimes ſo prevailing as to ſuperſede all regard to the common rules of fundamental progreſſions. For inſtance, if the ※ 5th take place in one chord, we are not much concerned about the fundamental progreſſion, provided that particular note may be heard *reſolved into* the ſixth, in the next chord: ſo that even in this caſe the fundamental baſs may ſometimes deſcend from the 3d to the 2d without offence. Inſtances of this paſſage, and others of the like kind, are to be found, authorized by the moſt eminent compoſers.

In Exam. XLVI. the ※ 5th is introduced three times in the accompanyment, and is always followed by a chord containing the 6th, as obſerved above. The two firſt paſſages repreſent a falſe, and a regular cadence; the laſt, marked with a ſtar, is the deſcent propoſed to be particularly exemplified.

The leap of a falſe fifth, or tritone, is diſallowable in a fundamental baſs, and when ſuch paſſages are admitted in the thorough baſs, they are to be eſteemed *licences*.

231. There is ſomething peculiar in the manner of accompanying theſe paſſages which are in ſome degree *forced* and unnatural, in order to make amends for that defect, as much as poſſible, which deſerves our notice the more, becauſe the beſt writers on thorough baſs, in our language, ſeem not to have been fully appriſed of its importance and uſe.

When the fundamental baſs falls a ſecond, by means of the third to the former chord being taken for a co-exiſtent fundamental, as in Exam. XLV. at the ſtars, it is better to omit the octave to the former fundamental note, and alſo to take the third uppermoſt in the chord, as often as is convenient, as is ſhewn in that example; becauſe, by that means, the third is rendered more remarkable, and the paſſage into the next chord more natural and eaſy.

The movement of the uppermoſt note of the chord, in a contrary direction to the baſs, is another well known method of helping theſe paſſages; for the management of which, in all caſes where it may be neceſſary, we muſt refer to the authors who have treated expreſly on that ſubject. The Exam. XLV. and XLVI. may ſerve at preſent as ſpecimens of the way of proceeding.

232. It muſt be well remembered, that theſe paſſages in which the fundamental baſs moves, either by the leap of a third or ſixth, or the deſcent of a ſecond, are not to be introduced too frequently, neither muſt they be taken indiſcriminately, and without deſign. We moſt ordinarily uſe liberties of this kind for the ſake of arriving more naturally at another chord which is to follow; and they generally indicate an attempt either to paſs into a new key, or to return into a former key; and ſuch an attempt, or *motive*, we can counteract in the accompanyment, by uſing only the ſounds belonging to the preſent key, when the new key would require one of them to be altered, or we can comply with it by admitting the altered note, according as taſte directs, or as the air of the treble, or *leading part*, requires; when we are to adapt a ſucceſſion of chords to a given melody.

For inſtance, in Exam. XLV. the firſt deſcent of a ſecond aims directly at a cadence on the 5th, as at H; with which we ſo far comply in the accompanyment as to admit the ※ third of the leading chord; but, foreſeeing that the harmony is not to reſt any time in the new key of the 5th, we rather chuſe to omit the 7th in the leading chord, which renders the cadence leſs deciſive, and leaves the ear more at liberty to paſs into another key. The ſame cadence is counteracted at P, in Exam. XLVI. to make way for the final cadence.

At I, the cadence on the 6th is introduced by the fundamental baſs falling a third, and at M the ſame cadence is brought in, by falling a ſecond: the former of theſe is counteracted in the accompanyment by retaining the natural 5th as a leſs third in the leading chord, but the latter is fully complied with.

At N, the cadence on the 4th is counteracted by giving the following chord an added diſſonance, to prepare for the final cloſe.

233. This judicious choice of proper ſounds, either for retaining or relinquiſhing the key, is called, by the artiſts, *Modulation;* which, although it may ſeem to be a ſubject more immediately concerning the compoſer, yet it is no leſs neceſſary to be underſtood by the ſinger in particular, becauſe it is only by turning our attention upon the governing key notes, as they ſucceed one to another, that we can poſſibly attain a maſterly, or indeed a juſt execution of vocal muſic. It is alſo very far from being uſeleſs to the performers upon inſtruments, and eſpecially to the players of thorough baſs, becauſe, if they do not obſerve what cadences are imitated, and what is the governing key in every paſſage, there is no chance of their executing with proper taſte and elegance; although the muſic be ever ſo well compoſed, and correctly copied. And for the learners encouragement in this matter, he may be aſſured, that if he begin with a little ſtudy of the fundamental principles, and keep the ſame conſtantly in view, in the courſe of his practice, he will find the neceſſary knowlege becoming familiar and obvious, long before the execution of thorough-baſs be attained to any tolerable degree.

The truth is, as the melody belonging to any one key, conſiſts but of a few degrees of ſound, ſo the harmony of one key conſiſts but of a very few chords; being naturally no more than three, *viz.* thoſe of the key and its two adjuncts, *viz.* 4th and 5th; the firſt being always perfect, and the two laſt having their added diſſonances, as ſhewn above; and whenever another chord, different from any of theſe, is introduced, it indicates an attempt to paſs into a new key; with which we may either wholly comply, both in the ſucceeding movement of the fundamental baſs, and the modulation of the accompanyment; or we may conform to it in the former, and counteract it in the latter; or we may wholly ſet it aſide, and return to the former key altogether.

234. In order to judge properly of the tendency of any chord, which does not immediately belong to the harmony of the preſent key, it is neceſſary to take particular notice of the natural relation of keys, on the one hand; and of the *ſimilarity* or uniformity of proceeding in each key, which is called *imitation*, and which is requiſite for conſtituting one connected whole, on the other hand: of both which the following obſervations will give ſome uſeful ideas.

235. In regard to the relation of keys, we have formerly obſerved, that the principal key of a ſharp ſeries is related to the new keys of the 4th or 5th as its adjuncts, or of the 6th, as its ſubſtitute: we have now to obſerve farther, that the 2d of the ſcale may be brought in as a ſubſtituted 6th to the 4th, as a new key; and the 3d may be introduced as a ſubſtituted ſixth to the 5th: ſo that, by conducting the harmony with judgment, firſt into thoſe keys which are *immediately* related to the principal, and afterwards into thoſe which are only related *mediately*, or by the interpoſition of another, we may occaſionally introduce all the ſounds of the ſcale as keys, except the 7th; if the piece be long enough to admit of them all.

236. To render this more familiar, it will be uſeful to remark, that in the courſe of one connected piece of muſic, we are not confined to the ſcale of the principal key alone, but we occaſionally make a tranſition into the ſcale of either of its adjuncts. Thus from the ſcale of the principal key C, we may paſs either into that of G, with a ♯ upon F; or into that of F, with a ♭ upon B: but we cannot paſs into any other ſcale except one of theſe two, without deſtroying the rememberance and expectation of the principal key; and, of courſe, the connexion of the piece: and it is hardly to be doubted, but that it was owing to ſome obſervations of this ſort, that *Guido Aretinus* paid ſuch a ſuperior regard to theſe three notes, F. C. G. in the ſignature of his cliffs. See Art. 55. In antient times, none but the ſcale of C, and its two adjuncts, appear to have been in uſe; the artificial or tranſpoſed keys being wholly the device of the moderns. However, our principal ſcale has ſtill its two adjunct ſcales, by whatever letter or mark it be denoted; and the nature of muſic is the very ſame, though the conſtruction of our inſtruments, or the manner of our writing muſic be ever ſo widely different.

237. The arrangement of the ſeveral ſcales in the general ſcheme, Art. 47. was made choice of on this very account, that the two adjunct ſcales belonging to any principal, might always be found next to it, the one above, and the other below, in that ſcheme: and in this light it will be worth while to peruſe the ſame ſcheme, in order to attain a ready knowlege of the relation between the ſeveral ſcales, as they are there placed.

Take any principal ſcale at pleaſure, ſuppoſe that of D, with F and C ſharp, N° 3. the ſcale of its adjunct 4th will be found next above, which in this caſe is G, with F ſharp, N° 2. and the ſcale of its adjunct 5th will be found next below, which, in this caſe, is A with F, C and G ſharp, N° 4.

Again, taking the ſcale of B♭ for principal, N° 11. the ſcale of E♭, N° 10. will be found, for the adjunct 4th, and that of F, N° 12. for the adjunct 5th.

Again, taking the ſcale of C for principal, N° 1. and N° 13. the ſcale of F, N° 12. belongs to the adjunct 4th, and that of G N° 2. belongs to the adjunct 5th.

238. To apply theſe remarks to our preſent purpoſe, we muſt further obſerve, that the natural ſcale offords two notes, upon either of which we can, with proper caution, make a perfect regular cadence, or indeed a final concluſion: for we

can cloſe either with the K, as we have pretty largely explained already, or with the 6th of the ſcale, if this 6th be uſhered in by the ※ 5th, as a leading note. The predominance of the K conſtitutes a tune of a ſharp ſeries: but the predominance of the 6th, and the conſtant expectation of recurring upon it at the concluſion, characteriſes a tune of a flat ſeries; of which more hereafter.

In this view, the 6th becomes an occaſional new key, without introducing a new poſition of the natural ſcale; being brought in whenever the ※ 5th is uſed inſtead of the natural 5th; and this may be properly enough called a *different modification* of the ſcale of the K. In like manner, the 2d takes place as a key, in the ſcale of the 4th, by ſharpening the original K, which is the fifth of that ſcale; and the 3d takes place as a key in the ſcale of the 5th, by ſharpening the 2d of the original ſcale, which is the fifth of this ſcale: ſo that we have ſix different keys, practicable in the courſe of one piece, though only three different poſitions of the natural ſcale, with the addition of an occaſional ※ 5th in each ſcale.

Theſe three ſcales we ſhall hereafter take the liberty of calling collectively by the title of *the ſyſtem of modulation*, of a given principal key.

239. Every key, as well occaſional as principal, has its two adjuncts; and the harmony chiefly dwells upon the chords of the key, and of theſe adjuncts, ſo long as that key is retained. Theſe adjuncts are always the perfect fourth and fifth to the key. Thus the principal K and the 2d are adjuncts to the 5th, as a new key; the ♭ 7th and K are adjuncts to the 4th as a new key; the 2d and 3d are adjuncts to the 6th; the 5th and 6th are adjuncts to the 2d; and the 6th and 7th are adjuncts to the third as a new key.

It is to be obſerved, that the 2d and 3d, ſtanding as adjuncts to the 6th, may alſo become new keys, ſubordinate to the 6th, as principal, in tunes of a flat ſeries; in the ſame manner as the 4th and 5th become new keys, ſubordinate to the K of the natural ſcale, in tunes of a ſharp ſeries.

From hence it appears, that the fundamental baſs ought not, upon any occaſion, to touch any of the altered notes in the ſyſtem of modulation, except the ♭ 7th, and this only as adjunct fourth to the 4th of the ſcale, as a new key. The fundamental baſs cannot touch the 7th of the ſcale, but as adjunct fifth to 3d as a new key: but the 3d and 4th may each take place in two ways; for, the 3d may come in either as a new key, or as a fifth to the 6th; and the 4th may be a new key, or a fourth to the principal key: and the K, the 2d, the 5th, and the 6th may each of them take place in three ways; *viz.* either as keys, or as fourths, or as fifths, to other keys.

240. For determining the ſpecies of every fundamental chord, we muſt take notice.

1*ſt*, That every key note takes its chord from the degrees of the principal ſcale, without allowing any alteration; ſo that, as the natural ſcale affords three ※ P chords, *viz.* thoſe of the K*f*, the 4th*f*, and the 5th*f*; and three ♭ P chords, *viz.* thoſe of the 6th*f*, the 2d*f*, and the 3d*f*: See Art. 147: ſo theſe degrees may all become keys; and muſt, in that caſe, bear the ſame ſpecies of chords reſpectively.

2*d*, That the adjuncts of every key naturally bear the ſame ſpecies of chord as the key to which they belong; except, in particular occurrences, the adjunct fifth belonging to a key with a ♭ P chord, bears its ※ P chord, for the ſake of rendering the cadence perfect.

Thus when the ♭ 7th and K, on the K and 2d, come in as adjuncts to the 4th or 5th, reſpectively; each of theſe notes bears its ※ P chord: but when the 2d and 3d, or the 5th and 6th, or the 6th and 7th, come in as adjunct fourth and fifth, to the 6th, or 2d, or 3d, reſpectively: the former, *viz.* the adjunct fourth, bears its ♭ P chord; but the latter, *viz.* the adjunct fifth, bears ſometimes a ♭ P, but more frequently a ✻ P chord, for the reaſon hinted above.

241. The adjunct fourth of every key may take an added ſixth, and the adjunct fifth may take a ſeventh for their proper diſſonances, after the ſame manner as in the principal key. But theſe diſſonances are to be admitted more ſparingly in keys which are more remote from the principal, for the reaſon hinted, Art. 232. in ſpeaking of the paſſage at H; becauſe the harmony muſt not dwell long in ſuch keys, but muſt paſs from them either into the principal key, or at leaſt into one more nearly related to it: otherwiſe the rememberance of the principal key would be loſt.

242. Theſe conſiderations will afford us clear and ſatisfactory ideas of the natural relation of keys one to another. We have already ſaid, that the 4th, 5th, and 6th, are the degrees which can moſt naturally be made new keys, ſubordinate to the K of the natural ſcale, as principal, in tunes of a ſharp ſeries; and that the 2d and 3d may come in only as *ſubſtitutes*, in the ſcales of the 4th and 5th reſpectively, or as adjuncts to the 6th. We may now conclude, that the new key of the 5th is more nearly related to the principal K, than that of the 4th, on account that the latter brings with it an altered note, *viz.* the ♭ 7th, as its adjunct fourth, whereas both the adjuncts of the former are notes of the natural ſcale. We may conclude alſo, that the new key of the 2d is more eaſy to be introduced than that of the 3d, becauſe the latter brings with it the 7th of the ſcale as its adjunct fifth, and this 7th cannot naturally become a fundamental; whereas the former has both its adjuncts among the other ſounds of the principal ſcale, which can naturally become fundamentals. Thus, by taking into account the adjuncts along with every key, we come at a ſolution of this, otherwiſe, myſterious queſtion, *viz.* Why is the new key of the 3d more difficult to be introduced than that of the 2d; and yet the ſcale of the 5th, in which that third takes place, is eaſier brought in than that of the 4th, upon which the ſecond depends? Experience confirms this to be the caſe; but yet no writer, that I know of, has attempted to account for it.

243. It is neceſſary to obſerve farther, that the adjunct fifth to any key is more eſſentially neceſſary to be uſed, than the adjunct fourth: for, without the chord of the fifth we cannot lead the attention to any key at all, but the harmony may proceed from the chord of the fifth upon that of the key, and contrariwiſe for a conſiderable time, without touching upon the chord of the fourth; ſo that, to aſcertain the natural ſucceſſion of keys, with greater preciſion, we are not to regard the two adjuncts as equally connected with the key: *the adjunct fifth muſt be introduced, in order to determine the key; but the adjunct fourth may take place or not, as the compoſer pleaſes, or as the given melody requires.*

244. Theſe things being premiſed, we may lay down the following practical rules for retaining or relinquiſhing the principal key.

(1.) For retaining the principal key, in the ſtricteſt manner, we ought to uſe no chords except thoſe of the K*f*, the 5th *f*, and 4th *f*; (*viz.* the key and its two adjuncts;) and the chord of the 5th *f* onght to have an added ſeventh, and that of the 4th *f* an added ſixth, as often as theſe can be admitted, and properly reſolved, as directed above.

(2.) We retain the principal key, in a larger ſenſe, ſo long as we uſe none but the ſeven ſounds of the ſcale belonging to that key, in the accompanyment of the thorough-baſs. The key is never effectually changed till an altered note appears; and thus any degree of the ſcale may be a fundamental, except the 7th, without introducing a change of the key, provided its chord be ſuch as the ſcale of the key affords, as deſcribed Art. 147; and provided the paſſages be choſen with diſcretion, as hinted Art. 232.

(3.) A change of the key is made by introducing one of the adjuncts, (generally the 5th) of the intended key into the fundamental baſs, with the proper accompanyment which belongs to it as ſuch, Art. 240, 241. And if the 5th of the new key be not firſt introduced, it muſt however be brought in as ſoon as convenient, becauſe the key is never effectually determined till the chord of its 5th be heard.

245. The order of the ſucceſſion of new keys depends much on the fancy of the compoſer: one principle however well deſerves our obſervation, *viz.* that the rememberance of the principal key may and ought to be kept up by means of a well choſen ſucceſſion of new keys: and this is effected by making ſuch tranſitions from one key to another as could not be allowed, if either of the two were the principal, and conſequently ſuch tranſitions as plainly indicate the dependance of both the new keys upon another principal. Thus, for inſtance, it is very common to paſs from the new key of the 4th to that of the 5th, and contrariwiſe; both of theſe keys bearing a ♯ P chord: and ſuch a tranſition plainly ſhews that neither of theſe is the principal key; becauſe, if the lower were the principal key, the upper would be its ſecond, and in this caſe the latter could not eaſily follow as a key, and if it were brought in as ſuch, it ought to bear a ♭ P chord: and if the upper were the principal key, the lower would be its flat ſeventh, and this, as ſhewn formerly, cannot be a key at all; but yet theſe two, conſidered as adjuncts to another principal, have a fine effect in ſucceſſion.

In the ſame manner the ſubſtituted 6th of the principal key may eaſily either follow or precede the adjunct 5th, as a new key, or the 4th, 5th, and 6th may take place ſucceſſively. Thus alſo the new key of the 3d may be introduced next to that of the 2d, both of theſe keys bearing a ♭ P chord, though this laſt is a more difficult tranſition than any of thoſe mentioned above; and, in ſhort, as all the degrees of the ſcale, except the 7th, may become new keys, dependent on the principal, ſo a tranſition may be made, on occaſion, from any one of them to any other, except from the 3d to the 4th, *& vice verſa*; between which the relation is ſo diſtant as to render the quick tranſition from one to the other almoſt, if not altogether, impracticable.

Upon the ſame principle we can immediately return to the principal key at any time, and from any of the new keys without the leaſt difficulty.

246. But in order to ſucceed in the enquiry concerning the natural ſucceſſion of keys, and the tendency of chords foreign to the preſent key, we muſt take particular notice of the propenſity of the mind towards *imitations*;; or the deſire of hearing the harmony proceed in a new key, in a manner ſomewhat ſimilar to what has been heard in a former key. This propenſity is ſo prevailing, in many caſes, as to overcome all other conſiderations, and to tranſport us, without any previous preparation, into keys which could not immediately follow, without the utmoſt diſguſt, were it not for the ſake of imitation.

Theſe imitations, being merely matters of taſte, are therefore not to be aſcertained by rules, and will be beſt learned by carefully obſerving the works of good compoſers. One circumſtance however is worth our notice, *viz.* that whether the original phraſe or portion we imitate be longer or ſhorter, whether the imitation be an exact copy of the original, or whether ſome variations be allowed, yet ſtill the imitating notes muſt be accented in the ſame manner with the original; that is, the accent or emphaſis muſt fall upon ſimilar parts of each paſſage, or otherwiſe the reſemblance will be totally loſt. Thus, for inſtance, a paſſage from an unaccented to an accented note, cannot be ſaid to be imitated by a paſſage from an accented to an unaccented note.

In Exam. XLV. the three notes at the firſt ſtar, are three times imitated at the following ſtars: but the paſſage at the ſtar, in Exam. XLVI. though it conſiſts of the ſame notes, is not any imitation of that firſt paſſage, in Exam. XLV; becauſe it is differently accented.

247. We ſhall proceed to give further examples of the application and uſe of all that has hitherto been ſaid on this ſubject.

In Exam. XLVII. XLVIII. XLIX. and L. the imitations, marked by the horizontal brackets below, conſiſt but of one cadence each: thoſe in Exam. XLVII. and L. are regular; thoſe in Exam. XLVIII. and XLIX. irregular.

The deſign of theſe examples is to ſhew, what influence the natural propenſity of the mind towards imitations has upon our choice of fundamental progreſſions. In Exam. XLVII. the 2d following a regular cadence on the 4th, is made leading note in another ſimilar cadence on the 5th; but in Ex. XLVIII. the ſame 2d, following an irregular cadence on the 5th, is made leading note in another ſimilar cadence on the 6th. In Exam. XLIX. the 6th following an irregular cadence on the 5th, is made leading note in another ſimilar cadence on the 3d; but in Exam. L. the ſame 6th, following a regular cadence on the 4th, is made to lead in another ſimilar cadence on the 2d. Thus the imitations are purſued throughout each example, except in as far as the regular cadence which is always neceſſary at the concluſion, does not fall in with the preceding imitations, in Exam. XLVIII. and XLIX.

We need not to dwell any longer on theſe examples, as their ſcope will not fail to be obvious to every reader: only it may be obſerved, that the cadences are the ſame with thoſe ſpecified, Art. 207. and Exam. XLI. but neither the altered notes, nor added diſſonances, are here admitted, in the middle cadences; by which means, the impreſſion of the principal key is more cloſely retained, and the tranſition from one key to another rendered more eaſy, as remarked, Art. 232. There was no abſolute neceſſity for this, but we found them ſo in Mr. *Lampe*'s *Thorough-baſs*, and in borrowing our examples from the ſtudied compoſitions of ſo great a maſter, we give the ſtrongeſt poſſible proof both of the truth and importance of the principles delivered above.

248. The Exam. LI. contains all the perfect regular cadences which are practicable in the ſyſtem of modulation of G, as principal of a ſharp ſeries: and here the imitation is purſued, all along, from one cadence to another, by making the baſs to aſcend one degree from the following note of one cadence to the leading note of the next; until we arrive at the cadence upon B, in the ſeventh bar, where we are obliged to ſtop; becauſe, if we were to purſue the imitation but one ſtep further, the next cadence would fall upon F; which, as we have formerly ſeen, Art. 238 and 239. does not belong to the ſyſtem of G: therefore, after forming the cadence upon B, we return immediately to the principal key G, in order to make the final cloſe there.

We may alſo trace out another imitation in this example, wherein each ſtrain comprehends two cadences, as ſhewn by the brackets put below: and, in this view, the laſt four notes of the baſs may be conſidered as an imitation of what is gone before; only theſe are to be differently accompanied in the upper parts, as directed by the figures, the note C taking an added ſixth, as adjunct 4th to the key G, in order to render the final cloſe more ſatisfactory.

This example is alſo taken from Mr. Lampe's Thorough-baſs. The reader will readily obſerve, that the marks put immediately below the notes of all the laſt five examples, ſhew what degree of the principal ſcale each note is: and further, that in Ex. LI. the occaſional new keys which take place, and the names of the notes in relation to theſe new keys are added in a line below, and that the changes, from one key to another, are ſhewn by the parentheſis), occuring in this lower line. There was no occaſion for this additional line under the other examples, becauſe there is not, in reality, any change of keys in them: for, although the movement of the baſs plainly aims at a new key in every middle cadence, yet theſe *motives* are counteracted in the accompanyments, as obſerved, Art. 232.

249. There is another kind of ſucceſſion frequently admitted in harmony called *a fundamental ſequence of ſevenths;* which we have purpoſely omitted to ſpeak of, till the propenſity of the mind towards imitations had been conſidered; becauſe it ſeems to be intirely founded thereon.

The fundamental ſequence of ſevenths is a ſucceſſion of regular cadences ſtill more cloſely connected than thoſe in Ex. LI. for in that ſequence every paſſage in the baſs repreſents a regular cadence, but theſe cadences are continually diſappointed in the accompanyment; by giving the leading chord a leſs third, when the ſcale of the key requires it, and by continuing the third of the leading chord, which becomes a ſeventh to that which follows, and by that means turns the following chord of one cadence, into a leading chord of another: and thus the baſs proceeds by leaps of a fourth aſcending, or fifth deſcending from one chord of the ſeventh to another, till we come to the perfect regular cadence on the key, which puts an end to the ſequence.

250. This ſequence may begin upon any degree of the ſcale as fundamental, provided the ſound which makes the ſeventh in the firſt chord of the ſequence be a continuation of any of the ſounds of the chord which precedes it; and this is called *preparing the ſeventh,* and muſt be well obſerved in this place, though we have not ſpoken of it before; becauſe though all ſevenths are beſt introduced when they come in as a continuation of a former ſound, yet that preparation is not abſolutely neceſſary in the added ſeventh, which belongs to the adjunct 5th of any key; and ſuch were all the ſevenths we have formerly had to do with.

251. The ſeventh to the firſt chord of this ſequence, and every other ſeventh, will be found prepared, if the fund. baſs
{ riſe a ſecond, or a fourth, or a ſixth, } from the note
{ fall a ſeventh, or a fifth, or a third, }
which precedes it, and all the ſucceeding ſevenths are prepared in the natural courſe of the ſequence; as may be ſeen in Exam. LII.

252. ANNOTATIONS to Fxample LII.

This example is in the natural ſcale of C, and the ſequence of ſevenths is four times introduced, and always ends upon the principal key. At H the ſequence begins upon the 2d of the ſcale, and the diſcord is prepared by the baſs riſing from the K. At I the ſequence begins upon the 6th of the ſcale, and the diſcord is prepared by the baſs falling from the K.

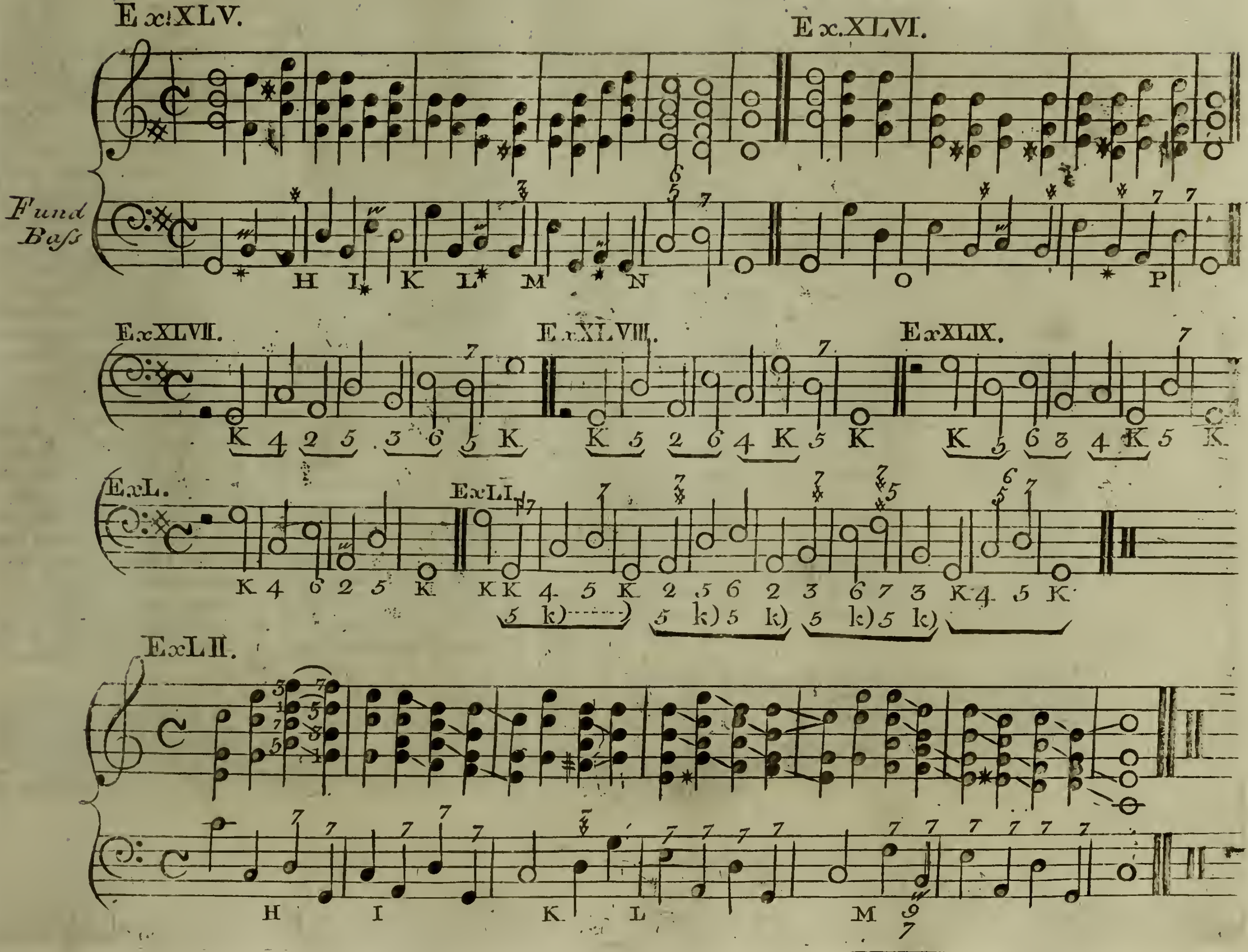
At L the ſame ſequence begins upon the 3d of the ſcale, and the diſcord is prepared by the baſs falling from the 5th of the ſcale. At M the ſequence begins upon the 4th of the ſcale, the diſcord being prepared by the baſs riſing from the K; and here the baſs is obliged to run through all the notes of the natural ſcale of the key before the ſequence come to a concluſion; and it is worth while to obſerve that the length (or number of ſteps) of the ſequence always depends upon the place of its beginning.

At K the ſeventh is prepared and introduced in the ſame manner as at H, but the occaſional ※ third being admitted in the next chord, brings the harmony into the new key of G, where a perfect regular cadence is made at the next ſtep; and it may be uſefully remarked that if the occaſional ※ third be admitted in any chord of this ſequence the next following note of the baſs will become a new key, and there the ſequence will end with a perfect regular cadence.

The upper parts of this example are annexed in a ſtaff of chords, to give the reader an opportunity of ſeeing more diſtinctly how the ſevenths are prepared and reſolved, and after what manner the courſes of the upper parts are reſtricted; as ſhewn by the direction of the ſtrokes which occur among the chords.

Plate VII.

facing p. 88.



Theſe ſtrokes take their riſe ſucceſſively by two and two together from the notes which make the ſeventh and fifth of one chord, and tend downward to the third and octave of the next chord, while the other two notes of the chord are held on, and become ſeventh and fifth in the following chord: ſo that in every ſtep of this ſequence, there are two deſcending and two holding notes; and the parts, which deſcend at one ſtep, hold on at the next ſtep, and ſo on, alternately deſcending and holding, till the perfect cadence on the K takes place; which is accompanied as directed formerly, Art. 196. and Ex. XXXVII. and this courſe the upper parts are reſtricted to take, when the accompanyment is full (*i. e.* when no omiſſions take place) except that on occaſion the loweſt note of the chord may be allowed to aſcend by a leap of an octave, inſtead of holding on, in order to avoid running too low. Thus the note E, at the bottom of the firſt chord of the ſequence at L, is tranſferred, at the ſtar, to E at the top of the next chord, by a leap of an octave. The ſame note E keeps its place at the ſtar in the next ſequence; and hence ariſes the difference in the ſucceeding chords of theſe two ſequences.

253. The greater ſeventh to the chord of F at M is allowed to deſcend, like the other ſevenths, though it is not its natural courſe, for the ſake of a regular ſucceſſion; and, for the ſame reaſon, the next note B has a chord of the ſeventh given to it, though it cannot naturally be a fundamental in the ſcale of C, neither can the leap of a falſe fifth, which is between F and B, properly take place in the fundamental baſs, Art. 230. To reconcile this paſſage to the rules formerly given, we are not to conſider the note B as the real fundamental of the chord which is given to it, though it appears as ſuch; for the real fundamental is G bearing the ſeventh, which belongs to the adjunct 5th of the key, and a ninth by way of ſuſpenſion of the octave into which it afterwards deſcends, Art. 173.; and yet G is not admitted in the baſs, but B is placed inſtead of it, for preſerving the uniformity of the ſequence. A direct is put upon G, and the figures 9 and 7, ſubjoined in the example, to ſhew the true origin of the chord above it.

254. The introduction of all diſcords, by *preparation*, is founded on a natural principle, which we have formerly had occaſion to mention, Art. 137. *viz.* that when we have previouſly ſet our attention upon any particular tone, we are ready to imagine we hear the ſame tone exiſting along with the other accompanyments of the next following chord, if the diſcords thereby introduced be not too harſh: for inſtance, an added ſeventh along with a third and fifth; or a ninth ſuſpending the octave, along with the ſame third and fifth; or a fourth ſuſpending the third, along with the octave and fifth: and, in general, all ſuſpending notes, ſuch as are enumerated in Art. 188. ought to be prepared by exiſting in the harmony of the preceding chord.

255. The fundamental baſs is ſometimes made to paſs by a leap of a third deſcending from one chord of the ſeventh to another, and ſometimes by a gradual aſcent, ſuch as the falſe cadence or gradation, each chord bearing a ſeventh; but theſe paſſages are to be eſteemed licences, and to be uſed with caution and ſkill †.

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† The modern French theoriſts have been at ſome pains to eſtabliſh another fundamental ſequence, wherein the baſs proceeds by leaps of a fifth aſcending, or fourth deſcending, in imitation of the irregular cadence; and each note is to be taken as an adjunct 4th, and to have an added ſixth: but if, according to the 3d part of Art. 244. it be neceſſary to introduce the adjunct 5th, in order to determine the key, and if it be neceſſary that every new key which we admit be ſufficiently determined; then we may preſume, that ſuch a ſequence as is deſcribed above, where nothing but adjunct 4ths appear, muſt not enter into the liſt of fundamental progreſſions; and this preſumption is ſtrongly ſupported; by obſerving, that among all the variety with which the moſt judicious modern compoſers ſtudy to enrich their works, no one inſtance of ſuch a ſequence can be found.

256. There is a ſtill greater fundamental licence frequently to be met with in modern muſic, where the ſeries is ſuddenly changed from ſharp to flat, and contrariwiſe, upon the ſame key note, in the middle of a piece. This was probably firſt introduced by the Italians, and adopted by other nations in imitation of them: and will be better underſtood when the flat ſeries has been more fully diſcuſſed in the next chapter.

CHAP. IX. *Of the* FLAT SERIES.

Article 257. HAVING occaſionally made mention of ſeveral of the moſt important particulars relative to the flat ſeries, in the preceding parts of this treatiſe, we ſhall not need to be ſo prolix in treating expreſly of it in this chapter; but ſhall rather briefly recapitulate and lay together the remarks formerly made, with the addition of ſuch further obſervations as ſeem neceſſary or uſeful.

In the note to Art. 29th, the flat ſeries is ſaid to be ‘made up by piece-meals out of two natural ſcales, ſo ſituated that the 5th of one ſcale is the key of the other,’ *&c.* And having ſhewn at large, in the laſt chapter, how nearly related the ſcale of the adjunct 5th is to that of the principal key, we may now ſafely ſuppoſe an intermixture of theſe two, in order to form a melody which regards the 6th of the ſcale as principal key, rather than either of the other keys.

258. The intervals of the flat ſeries, when reckoned from its key, differ from thoſe of the ſharp ſeries reckoned from its key, in the 3d, 6th, and 7th degrees; for the flat ſeries has a leſs 3d, a leſs 6th, and a leſs 7th: and theſe intervals are found in the natural ſcale, by beginning from the 6th as a key; for the K of the ſcale becomes a leſs 3d, the fourth of the ſcale becomes a leſs 6th, and the fifth of the ſcale becomes a leſs 7th: and therefore, after obſerving by the marks at the cliff what is the key of the natural ſcale, as directed, Art. 38. *& ſeq.* if we find a piece of a muſic, not ending upon this key, but two degrees lower, *viz.* upon the 6th of the ſcale, we may conclude ſuch a piece to be in the flat ſeries of that 6th as its key note: and contrariwiſe if the natural ſcale of any note be propoſed, and if it be required to find where the flat ſeries will go off without altering any of the notes, we muſt pitch upon the 6th of the ſcale for that purpoſe. For example, if a piece of muſic have B♭, at the cliff, and yet do not end on F, but on D, it is in the flat ſeries of D: and if it be required to ſet the flat ſeries with two ſharps, [*viz.* F and C, which make the natural ſcale of D] we muſt take B, which is the 6th above, or the 3d below D, for a key; and the ſame in all other caſes.

259. To ſet a tune of a flat ſeries upon any degree of the ſemitonic ſyſtem formerly deſcribed, Art. 40. *& ſeq.* as its key; we muſt ſo order the flats or ſharps which are put at the cliff, as to bring in the natural ſcale of that degree which makes the leſs third to our key note; and, by this means, the general ſcheme, in Art. 48. will be made to ſerve for the flat ſeries alſo, if we firſt look for the degree intended to be made the key in the general ſyſtem, then count three ſemitones forward,

which brings us to the leſs 3d, and then guiding the eye downward till we come to the line in which the ſame leſs 3d ſtands as a key, we ſhall find on the right of this line the ſharps or flats neceſſary to be placed at the cliff. For example, to find the flat ſeries of A, we look firſt for A in the general ſyſtem, then go forward three ſemitones to C, and then looking downward we find C, the firſt of the natural ſcale, (*i. e.* the key,) in the very next line, and the words *all natural* on the right, from which we conclude, that the flat ſeries of A muſt alſo be *all natural notes*. Thus alſo to find the flat ſeries of D, we muſt firſt go forward to F, and then downward till we find F, the firſt or laſt of the natural ſcale, *viz.* in the loweſt line but one; and the words *B flat*, on the right, are our direction for ſetting the flat ſeries of D. Again, to find the flat ſeries of G, we go forward to the ſtar between A and B, and then downward in the column under this ſtar we find B♭, the firſt and laſt of the natural ſcale, in the third line from the bottom, and the direction *B and E flat*, on the right. If it were required to ſet a flat ſeries upon the ſemitone (or ſtar) between A and B (which yet we know not whether to call A※, or B♭,) as a key, we muſt look three ſemitones forward to the ſtar between C and D, and then downward in the column under this ſtar we find, in the 8th ſcale, C※ with *all ſharp* on the right, or D♭ with *B E A D and G flat* on the right; either of which will anſwer our purpoſe, only if we make uſe of the ſharps, our key note will be A※; and if we make uſe of the flats, which are preferable, our key note will be B♭.

260. After a little practice in muſic, the proper manner of ſetting either the ſharp or flat ſeries of any of the more accuſtomed keys will become familiar and obvious, without conſulting any ſcheme or table for that purpoſe: and it may be of uſe to obſerve, by the way, that the taking away of three ſharps, or the adding of three flats; or, which is the ſame in effect, the taking away two ſharps, and adding one flat; or taking away one ſharp and adding two flats, will reduce the ſharp ſeries of any key to the flat ſeries of the ſame key; for this will always be found to bring down the 3d, 6th, and 7th degrees of the ſcale a ſemitone lower. For inſtance, the ſharp ſeries of E takes four ſharps [F, C, G, and D]; and the flat ſeries of E takes but one ſharp [F]. The ſharp ſeries of G takes one ſharp [F]; and the flat ſeries of G takes two flats [B and E]. The ſharp ſeries of F takes one flat [B]; and the flat ſeries of F takes four flats [B, E, A, and D]. And ſo in all other caſes. — And this remark is of more uſe ſince the licence mentioned in Art. 256. of paſſing from the ſharp to the flat ſeries, *& vice verſa*, upon the ſame key note, in the middle of a piece of muſic, is become ſo common; which paſſages, though in themſelves unnatural, we are obliged to familiarize, and learn to reliſh, before we can enter into the ſpirit of the modern muſic.

261. Thus far the flat ſeries ſeems to be made up entirely out of the natural ſcale of that degree which makes the leſs third of the ſeries, and to which, of courſe, its key bears the relation of a ſubſtituted 6th; but as the flat ſeries has been called an *intermixture* of the natural ſcale of the key and adjunct 5th, it may be proper, in this place, to take notice, that this intermixture cannot be fully explained till we come to treat of *occaſional temperament*. Though the flat ſeries does not *eſſentially* take in the ※4th, which belongs to the ſcale of the adjunct 5th; yet this ※th *accidentally* takes place as a 6th in the flat ſeries, much in the ſame manner as the ※5th occaſionally makes the leading note, or 7th, of that ſeries. Art. 138. but the flat ſeries eſſentially takes in a part of the tempered notes, called *grave* and *acute*, Art. 23. 24. of both ſcales.

262. By admitting this intermixture of two ſcales, and calling the key of the flat ſeries a ſound, *partly ſixth and partly ſecond*, we reconcile the preſent method of ſetting this ſeries with that which was in uſe till within the laſt 50 or 60 years; and

which is ſtill retained in the lateſt editions of the works of Corelli, Rameau, *&c.* Theſe authors ſet the flat ſeries of D in the natural ſcale of C, and put an occaſional flat to the note B, which is the ſixth of the ſcale, in the courſe of the piece, whenever a flat ſixth is required. After the ſame manner the flat ſeries of G is ſet with one flat only at the cliff, which makes the natural ſcale of F; and ſo of all others wherein we put a ♭ at the cliff, upon the ſixth of the ſeries, they omit this character at the cliff, and place it occaſionally among the notes; which is a proof that they conſidered the 6th of the ſeries as an ambiguous note, or, which is the ſame thing, they conſidered the key of the ſeries as the 2d of the natural ſcale in theſe pieces. But they ſet the flat ſeries of A, of E, and of all other keys which require ſharps at the cliff, exactly as we do.

263. The flat ſeries ought to be practiſed in the ſame manner, and with the ſame view, as was directed in regard to the natural ſcale, in Chap. I. and II. taking along with us, a few cautions, which follow.

(1.) The flat ſeries muſt be ſung by gradual ſteps deſcending, as repreſented, Plate VIII Exam. LIII. rather than aſcending: for it will be eaſily perceived, that in aſcending, when we are come to the 6th note, which is a leſs 6th, we cannot naturally aſcend from it to the ſharp 7th, becauſe this is an interval of a *trihemitone;* and if we take the natural (or leſs) 7th, and ſo proceed to the key, the cadence is not ſatisfactory nor concluſive, for want of the leading ※ 7th: beſides, the leſs 6th is a *heavy* ſound (correſpondent to the grave fourth of the natural ſcale) and on that account we deſire to hear it deſcend into the fifth; therefore, in compliance with this deſire, and at the ſame time to bring in the cadence on the key which is expected at the eighth note, we naturally repeat the 5th in place of the ※ 7th; as ſhewn, Exam. LIV.

(2.) The only practicable method of making a gradual aſcent in the flat ſeries, ſo as to cloſe upon the key note, is to take the ※ 6th and ※ 7th, as repreſented in the treble part of Ex. LV; and by this means the upper half of this ſeries becomes exactly the ſame with the tetrachords of the natural ſcale, deſcribed, Art. 12.; and the only degree in which this aſcending ſeries differs from the natural ſcale is the leſs 3d: ſo that good care muſt be taken that this leſs 3d be properly ſounded, or otherwiſe we ſhall paſs altogether into the ſharp ſeries.

264. From hence it appears, that although the leſs 6th and leſs 7th do moſt properly belong to the flat ſeries, yet the greateſt 6th and ※ 7th are not to be excluded on many occaſions; and therefore the 6th and 7th may be juſtly eſteemed *variable* ſounds, in this ſeries; the greater taking place in aſcending to the key, and the leſs in deſcending from it.

265. For aſcertaining the fundamental progreſſion, in muſic of a flat ſeries, it will be proper to look back to Art. 150. for the definitions of ſharp and flat harmony: and to Art. 238 and 239, where the predominance of the 6th of the ſcale as a principal key, and the affinity between a key and its two adjuncts is explained. And, to apply theſe particulars to the preſent purpoſe, we may obſerve further, that it is neceſſary not only that this 6th, which is the principal key of a flat ſeries be plainly indicated at the beginning, but alſo, that the rememberance of it be kept up by refering the following ſounds to the chords of this key, and of the 2d *f.* and 3d *f.* which are its adjuncts, as often as convenient; and by frequently introducing the ※ 5th, which is the ſharp ſeventh, or leading note of this key, in the courſe of the piece: for otherwiſe the real key of the natural ſcale, and its adjuncts, will attract too much of our attention; and the expectation of recurring upon the 6th at the concluſion will ceaſe, and the connexion of the piece, Art. 31. will be deſtroyed.

266. The muſic of the flat ſeries, having *leſs of nature*, requires *more of art*, to render it fully ſatisfactory. Yet we are not neceſſitated to dwell conſtantly upon the flat harmony of

the key and its adjuncts, but may occaſionally admit the ſharp harmony of the real key of the natural ſcale and its adjuncts, in the middle of a piece, provided care be taken to return to the original key in due time.

267. Theſe particulars are briefly exemplified in the fundamental baſs, to Exam. LV. where the aſcending and deſcending flat ſeries are refered to the very ſame fundamentals in relation to this key, as were aſſigned to the natural ſcale in relation to its key, in Art. 216. and Exam. XLII. and theſe fundamentals bear the ſame ſpecies of chords reſpectively, only the accidental ſharp 7th, and natural 6th of this ſeries are obliged to be ſhewn in the figuring, when they take place as thirds in the chords of the adjunct 5th and 4th of this key. And it may be obſerved, that we give the adjunct 5th its ſharp third in all occurrences, except at I, where the treble takes the leſs third of this fundamental, in order to deſcend. The adjunct 4th has a greater third at H, becauſe the treble is obliged to take the ſame greater third, in order to aſcend; but otherwiſe the adjunct 4th ought to bear a leſs third as its proper chord. The chord at K has a falſe fifth, which is allowed, becauſe the treble moſt naturally takes that ſame note, in deſcending.

268. The deſcending ſeries at the end of this example is refered to a different fundamental progreſſion, by admitting the ſharp harmony at L, and returning to the original key, by the falſe cadence at M: which latter progreſſion is much more natural than the former, but then it is not properly flat harmony, except the firſt chord and the final cadence.

269. It is neceſſary to obſerve further, that the fundamental paſſages which appear ſimilar, have yet a very different effect in ſharp and flat harmony; particularly the added ſeventh in the leading chord of flat harmony is leſs natural, ariſing in a great meaſure from the neceſſity of its falling by a ſtep of a whole tone for reſolution: which to avoid it was cuſtomary, in former times, to fall only a ſemitone, and by that means introduce the ♯ 3d to the final chord: but then this ♯ 3d, ſo far as it is attended to, appears foreign to the muſic; and is eaſieſt practiſed, on the organ or harpſichord, where it may paſs unregarded as one of the natural conſonances of the final key, Art. 137. We have not the ſame opportunity when voices or ſingle inſtruments join together in concert, becauſe, tho' it might paſs unregarded by a hearer, who attended only to the united effect of the whole, yet it would be offenſive in the higheſt degree, to the particular performer whoſe part it might be to introduce it. It is almoſt indiſpenſibly neceſſary to omit the ſeventh in the leading chord of the final cadence in flat harmony, in compoſing vocal muſic, becauſe the reſolution of that ſeventh, either upon the ♯ third, or upon the ♭ third of the key is an unſatisfactory ending to the ſinger who performs it. The third of a ♭ P chord ought to be *a diſregarded, loſt ſound*, Art. 141.

270. The adjunct 4th *f*, when followed by the 5th *f*, which is the gradation, in flat harmony, admits of a different accompanyment; for that 4th *f* may take a ſeventh for its added diſſonance, if the courſe of the upper parts require it, and this ſeventh is reſolved by falling a ſemitone, and becoming a fifth in the following chord; as ſhewn at N in Exam. LV. where the directs in the upper ſtaff ſhew the progreſs of that part which makes and reſolves the ſeventh as above.

271. The diſallowance of a gradual deſcent in the fundamental baſs, from the K or from the 5th, which takes place in ſharp harmony, as ſhewn, Art. 229. does not extend to flat harmony in reference to its key: for here the key, being the 6th of the natural ſcale, we may make a deſcent from the 6th on the 5th, as obſerved in the beginning of the ſame article: and the adjunct 5th of flat harmony, being the 3d of the natural ſcale, we may make a deſcent from it upon the 2d of the ſame ſcale, which is the adjunct 4th, as ſhewn, Art. 230. and

at the ſtar, in Ex. XLVI.—— The other peculiarities of flat harmony will be learned by practice.

272. The ſucceſſion of occaſional new keys in muſic of the flat ſeries is alſo eaſily accounted for, by obſerving that the very ſame ſyſtem of modulation, deſcribed, Art. 238. takes place in all muſic; and conſidering, as we have all along done, that the flat ſeries has the 6th of the natural ſcale for its principal key note; from whence it will follow, that the adjuncts of this key may become new keys ſubordinate to the principal; and that, of the two, the adjunct 4th, which is the 2d of the natural ſcale, is eaſier brought in, than the adjunct 5th, which is the 3d of the ſcale; according to the remark at the end of Art. 242. When the key of the natural ſcale is allowed to take place, the manner of proceeding has been already largely explained.

273. Here it will be very proper for the reader to examine other fundamental progreſſions, by the rules delivered above; and of this ſort the firſt five leſſons in *Paſquali's* Thorough baſs are very good: theſe, being examples of different ſucceſſions of common chords, are undoubtedly fundamental progreſſions, only the diſcords are left out, becauſe the learner is ſuppoſed able to ſtrike nothing but perfect or common chords. Theſe leſſons, particularly the 1ſt, and 5th, contain more variety of modulation than is to be met with in any other pieces of the ſame length; becauſe the compoſer's chief aim was to introduce as great a variety of paſſages in as ſmall a compaſs as he could, conſiſtent with the nature of harmony, and the rules he propoſed to exemplify.

274. The Exam. LVI. is Paſquali's firſt leſſon, or general prelude, with marks ſubjoined, for a ſpecimen of the way of examining here preſcribed. Theſe marks ſhew the keys which take place, and the relations of the other notes to the keys to which they belong. The principal key is diſtinguiſhed by a capital, and the ſubordinate keys by ſmall letters, and the changes, or paſſages from one key to another, are ſhewn by the parentheſis), in the the ſame manner as at the foot of Exam. LI.

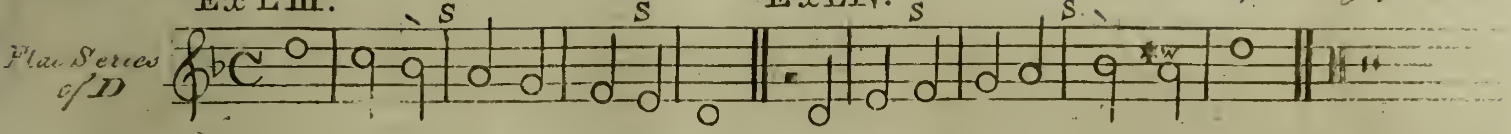
In this leſſon all the different keys are introduced which are practicable in the ſyſtem of modulation of F, (the key of the natural ſcale) except C which is the 5th of the natural ſcale, and the 7th of the flat ſeries; and it is plain, that this might eaſily have been brought in, but that it would have required the uſe of that poſition which Paſquali calls the *ſecond chord* of G; and this is not intended to be practiſed till the learner come to the 3d and 4th leſſons of that well digeſted and uſeful ſyſtem of inſtructions.

275. The frequent occurrence of the adjunct 5ths is remarkable both in this and all other pieces of harmony; and it may be obſerved, that in every key the adjunct 5th appears once at leaſt, agreeable to the 3d part of Art. 244. and the paſſages, while the ſame key is retained, are all of the eaſieſt kind, *viz.* regular, or irregular, or falſe cadences, or gradations, agreeable to Art. 213; and the other paſſages, in which the key changes are all agreeable to the rules in the preceding chapter.

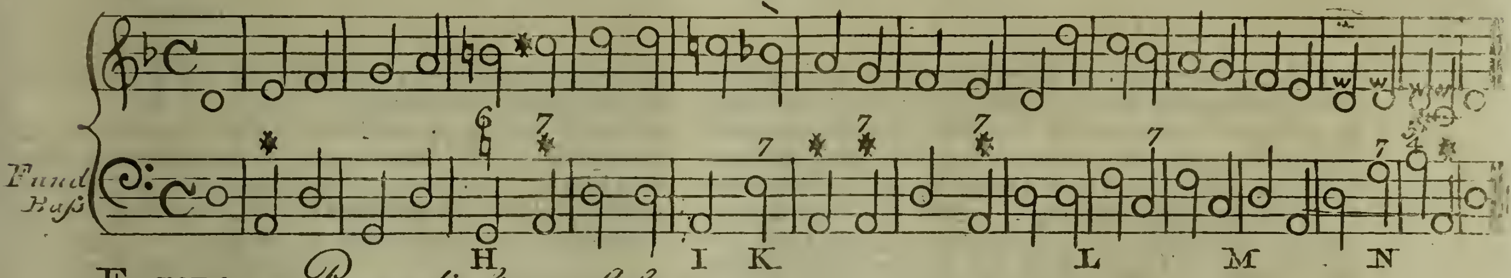
276. The ſecond leſſon in Paſquali's Thorough-baſs is in the ſharp harmony of G, as principal key; and the gradation from the 4th *f* to the 5th *f*, *viz* from C to D, is introduced as often as poſſible, becauſe this is the paſſage propoſed to be exemplified.— *Note*, that in the 8th bar of this leſſon C is introduced following D, which, according to Art. 229. is not to be allowed *in the middle of one connected ſtrain:* and, to reconcile this paſſage, it may be obſerved, that the ſtrain is brought to a concluſion upon D, the former of theſe notes; and that altho' the introduction of the chord of C, at the next note, makes a ſenſible breach in the harmony, yet it is tolerated as being a return into the original key, agreeable to the laſt paragraph of Art 245.

The 3d, 4th, and 5th leſſons are perfectly conformable to our rules, and therefore need no annotation.

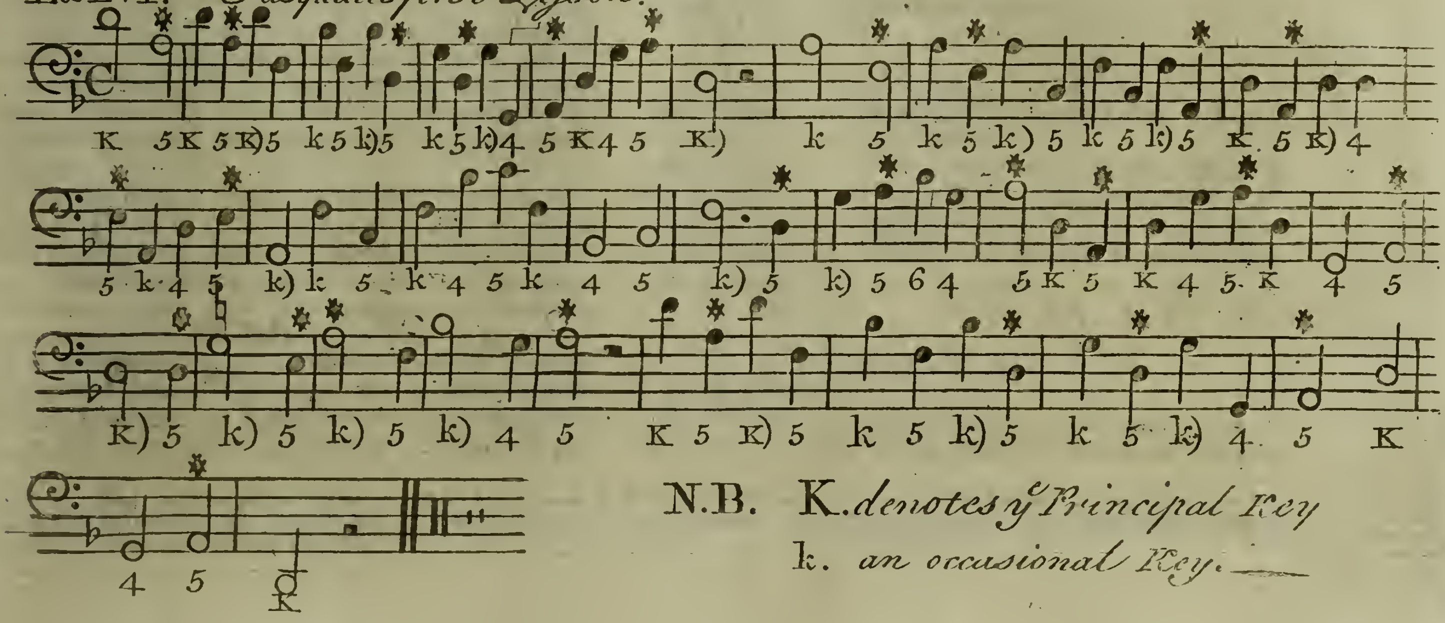
Ex LIII. Ex LIV.



Ex LV.



Ex LVI. *Pasqualis first Lesson.*


K 5 K 5 K) 5 k 5 k) 5 k 5 k) 4 5 K 4 5 K) k 5 k 5 k) 5 k 5 k) 5 K 5 K) 4
5 k 4 5 k) k 5 k 4 5 k 4 5 k) 5 k) 5 6 4 5 K 5 K 4 5 K 4 5
K) 5 k) 5 k) 5 k) 4 5 K 5 K) 5 k 5 k) 5 k 5 k) 4 5 K
4 5 K

N.B. K. *denotes ye Principal Key*
k. *an occasional Key.*

CHAP. X. *Of* CHROMATIC.

Article 277. IT is a fact ſufficiently proved and acknowledged, that *all melody is founded on harmony*, and that every ſinger conforms his ſounds to certain fundamental progreſſions, whether he be acquainted with the principles of muſic or not, if he have a natural talent for it. It is as natural to conform our ſounds to certain fundamental progreſſions, in ſinging, as to conform our attitudes to certain laws of gravity and motion, in walking.

If it be aſked, why we do not moſt naturally ſing the fundamental baſs itſelf, our anſwer is, That the diſtant leaps by which this part ordinarily proceeds are not ſo ſuitable for the voice, as the gradual ſteps of the ſcale which conſtitute the main part of our melody. The voice moves by ſmall intervals, but the ſucceſſive governing fundamentals are farther diſtant one from another.

278. This preference, which the very nature of the voice obliges us to give to ſmall intervals, accounts for a peculiar ſucceſſion frequently introduced in modern melody, which aſcends or deſcends by ſeveral ſteps of a ſemitone each, and is called *Chromatic Muſic**. We ſhall examine, in a few words, the nature and origin of this ſpecies of melody.

279. The fundamental progreſſion of all melody, however diverſified, muſt ſtill be agreeable to the rules formerly laid down; and, in general, the melody which is eaſieſt to be ſung or reliſhed is founded on the moſt natural fundamental progreſſion: and, conformable to this principle, we find ſome paſſages of the chromatic kind ſufficiently eaſy and agreeable, while others are extremely difficult. For example, a ſucceſſion of three contiguous ſemitones aſcending, from the 3d to the 5th, may eaſily be produced by two regular cadences in ſharp harmony, as repreſented below; where the ſucceſſive ſounds of the baſs, and upper part, are denoted by the degrees of the ſcale, placed one after another, and the figuring of the chords of the baſs is put over ſuch degrees as require it.

Upper part	3.	4.	※4.	5.
			※	
Fundamental baſs	K.	4.	2.	5.

See alſo Plate IX. Exam. LVII. where the ſame paſſage is ſet in notes, in the natural ſcale of C.

280. A ſucceſſion of five contiguous ſemitones, aſcending from the 7th to the 3d, may alſo be produced by three regular cadences in ſharp harmony, but with greater difficulty; becauſe the cadences on which it it is founded, are more foreign to the principal key.

Upper part	7.	K.	※k.	2.	※2.	3.
			※		※	
Fundamental baſs	5.	K.	6.	2.	7.	3.

See Exam LVIII.

281. Theſe two ſucceſſions may be joined together by repeating the 3d of the ſcale in the upper part, or by changing

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* The Greeks, from whom we borrow this name, reckoned three kinds of Muſic, *viz.* Diatonic, Chromatic, and Enharmonic. The Diatonic proceeded by the ſteps of the natural ſcale; the Chromatic, as above deſcribed; and the Enharmonic, by ſtill ſmaller intervals, nearly ſimilar to the occaſional temperament, of which we ſhall treat hereafter.

the fundamental in the middle of that note, but not otherwiſe.

Upper part	7.	K.	※k.	2.	※2.	3.	3.	4.	※4.	5.
			※		※				※	
Fund. baſs	5.	K.	6.	2.	7.	3.	K.	4.	2.	5.

Here the quick tranſition from the cadence on the 3d to that on the 4th, which happens at the repetition of the 3d in the upper part, is very difficult, (ſee the laſt part of Art. 245;) and therefore a ſucceſſion of chromatic, aſcending all along from the 7th to the 5th, is rarely to be met with in ſharp harmony.

282. The ſame paſſages ſucceed much better in flat harmony; where the 2d and 3d of the natural ſcale are more nearly related as adjuncts to the principal key; and where the 4th of the natural ſcale, immediately following the 3d, has the appearance of a falſe cadence: where alſo the ſharp 5th followed by the 6th naturally comes in at the cloſe of the ſucceſſion, and ſo brings the harmony to a concluſion on this 6th as principal key. Theſe degrees, counted from the key of the flat ſeries, ſtand thus;

Upper part	2.	3.	※3.	4.	※4.	5.	5.	6.	※6.	7.	※7.	K.
			※		※				※		※	
Fund. baſs	5.	K.	k.	4.	2.	5.	3.	6.	4.	7.	5.	K.

See Exam. LIX. in the flat ſeries of A.

283. A ſucceſſion of three ſemitones, deſcending from the key to the 6th, may be produced in the ſharp harmony, by an irregular cadence on the 5th, followed by a regular cadence on the 4th. And three ſemitones, deſcending from the 5th to the 3d, may be produced by an imitation of the fundamental ſequence of ſevenths.

Upper part	K.	7.	♭7.	6.	5.	※4.	4.	3.
			♭7		7	※	7	
Fund. baſs	K.	5.	k.	4.	6.	2.	5.	K.

See Exam. LX. in the natural ſcale of C.

284. It is not eaſy to purſue either of theſe ſucceſſions any further in ſharp harmony, without admitting the ſudden change from the ſharp to the flat ſeries, mentioned, Art. 256.; but in flat harmony the deſcending chromatic may be carried a greater length, for the ſame reaſon which was aſſigned in regard to the aſcending chromatic, in Art 282. *viz.* the affinity between the principal key and the degrees on which the cadences fall.

The flat ſeries admits of two deſcending ſucceſſions of five ſemitones each, as here repreſented; counting the degrees from the key of the ſeries.

Upper part	K.	K.	※7.	7.	※6.	6.	5.	5.	※4.	4.	※3.	3.	2.	K.
										7				
		7	※	7	※	7		7	※	※	※	7	※	
Fund. baſs	K.	2.	5	k.	4.	7.	3.	6.	2.	5.	K.	4.	5.	K.

See Exam LXI. in the flat ſeries of A.

285. Theſe fundamental ſequences, which produce a deſcending chromatic melody, differ from the ſequence of ſevenths, deſcribed Art. 249. *& ſeq.* in the ſpecies of each alternate chord, which here has the third accidentally ſharpened, and the ſeventh omitted. The ſharp thirds are neceſſary in conformity to the melody, and the ſevenths muſt be omitted at thoſe occurrences, becauſe, if a ſeventh were added, the ſharp third would be neceſſitated to riſe, as obſerved in the ſecond paragraph of Art. 252. whereas the ſucceſſion of the melody requires that the ſame note fall a ſemitone.

286. The difficulty of ſinging chromatic muſic is not owing to the ſmallneſs of the intervals, as is generally ſuppoſed; for on this account it ought rather to be eaſier: but it is owing, in a great meaſure, to the quick, and frequently *forced* tranſitions from one key to another, ſo that we are apt to be at a loſs for a proper fundamental progreſſion, without which we can neither reliſh this nor any other melody. Add to this, that ſeveral of the altered notes are not allowed to take their natu-

ral courſe, according to Art. 230. And to increaſe the difficulty, in deſcending chromatic, the ſevenths which occur are not prepared as they ought to be, by Art. 250, and 254.

287. The ſame chromatic paſſages may ſometimes be refered to different fundamental progreſſions, which the learner will obſerve in the courſe of practice. Thoſe we have aſſigned above are the moſt natural, and will give a ſufficient idea of the manner of proceeding in other caſes.

288. The gradual and often unexpected elevations of the voice, in aſcending chromatic, render it remarkably expreſſive of reviving hope; and the contrary depreſſions of deſcending chromatic are as aptly ſuited to languiſhing and dejection.

Chap. XI. *Of* Plain Descant.

Article 289. THE art of compoſing, or *ſetting muſic* in ſeveral parts, is called Descant; and this is diſtinguiſhed into plain and figurative. Plain deſcant is that wherein the correſponding notes in all the parts are of equal value, and is ſometimes called *counterpoint*, becauſe this kind of compoſition was formerly denoted by points, diſpoſed in columns, much like our manner of repreſenting the chords of the thorough baſs. Figurative or florid deſcant is that wherein the notes of one or more of the parts are frequently ſubdivided and broken into ſeveral ſhorter ones, according to the fancy or taſte of the compoſer, but under certain reſtrictions. It is neceſſary firſt to lay down the rules of plain deſcant, the other being juſt the ſame, with additional ornaments of melody.

290. To handle this ſubject in the moſt intelligible and uſeful way, we ſhall, for the preſent, ſuppoſe, that a certain ſimple or plain melody is given, which may be called the principal or firſt treble; and we ſhall lay down the moſt material rules for compoſing a thorough-baſs, a ſecond treble, and a tenor or inner part to this given melody, in plain deſcant.

291. The firſt thing to be done, is to aſcertain the proper fundamental progreſſion of the given melody; which will not be difficult, if the rules and obſervations in the three preceding chapters be duly attended to; as we have all along ſuppoſed the fundamental progreſſions *ſuggeſted by*, or ſome way *connected with*, the paſſages of the melody. See Art. 199.

292. A particular regard muſt be had to the expectation of cadences, as deſcribed, Art. 216, 217, and 218. which depends upon the natural diviſion of all muſic into certain phraſes or ſtrains, Art. 103. and upon the reſts or pauſes which the ſenſe may require, when muſic is adapted to words: and here the expectation muſt not be diſappointed without a particular view to ſome intended expreſſion. For inſtance, the irregular cadence on the key is peculiarly emphatical in church muſic, in the *Amen*, at the concluſion of a petition; for which reaſon ſome choriſters call it the *Amen cadence*. The regular cadence diſappointed by a falſe cadence, as deſcribed, Art. 209. may be very properly uſed when a queſtion is aſked, the movement of the baſs in a falſe cadence having ſo near a reſemblance to the natural inflection of the voice in an interrogation. This

is well exemplified by Dr. Arne, in the beginning of the ſong, "*Gentle Youth, ah! tell me why,*" &c.

293. In aſſigning the fundamentals of a given melody, thoſe movements which we have formerly called *neceſſary*, in the cadences, muſt be carefully obſerved; becauſe, if the given melody take the former note of any of theſe reſtricted paſſages, and not the latter, or if it take the latter note which ſhould reſolve the diſcord preceded by another note, and not the diſcord itſelf, the fundamental progreſſion muſt either be differently aſſigned, or the diſcord whoſe reſolution would occaſion the doubling of the reſolving note, muſt be left out of the leading chord: and ſuch occaſional omiſſions ought to be ſhewn in the figuring of the fundamental; as explained, Art. 219.

The expreſſion may ſometimes be heightened in the middle of a phraſe, by a judicious choice of fundamental chords. For inſtance, thoſe chords which include occaſional ſharp notes, may be uſed to expreſs joy and elevation; and, on the contrary, thoſe which include occaſional flat notes may expreſs ſorrow and depreſſion: a diſſonant chord may expreſs doubtfulneſs and perplexity; an unexpected chord, ſurprize, *etc.* and it is very proper to have theſe particulars in view, becauſe we ſometimes have it in our option to chuſe different fundamentals, though, for the moſt part their progreſſion is limited by the given melody; and we often have liberty either to admit, or not admit, an altered note, or an added diſcord.

294. Though the thorough baſs is the loweſt part heard in a concert, yet it is ſtill to be conſidered as an upper part in reſpect to the fundamental; and as ſuch may take any of the notes of the ſucceſſive chords, for the ſake of an eaſy ſucceſſion, only taking care that the following reſtrictions be obſerved, which are deduced from the principles already delivered.

(1.) The thorough-baſs muſt coincide with the fundamental at the final cadence, and alſo at the cadences which conclude every principal ſubdiviſion or ſtrain.

(2) In other places where the thorough-baſs differs from the fundamental, the inverted chords thereby introduced muſt be ſhewn by proper figuring, according to Art. 188; and the paſſages muſt be ordered as follows.

(3.) A baſs note, bearing a chord of the ſecond muſt paſs into the next lower degree, bearing either a chord of the ſixth, or of the ſixth and fifth.

> The former of theſe is the diſcord 7th reſolved in a regular cadence; and the latter is the ſame 7th reſolved in a ſequence of ſevenths; as at H and L, in Ex. LXII. in the ſharp ſeries of C.

(4.) A baſs note, bearing a chord of the ſixth fourth and third, muſt paſs into the next lower degree, bearing either a perfect chord, or a chord of the ſeventh.

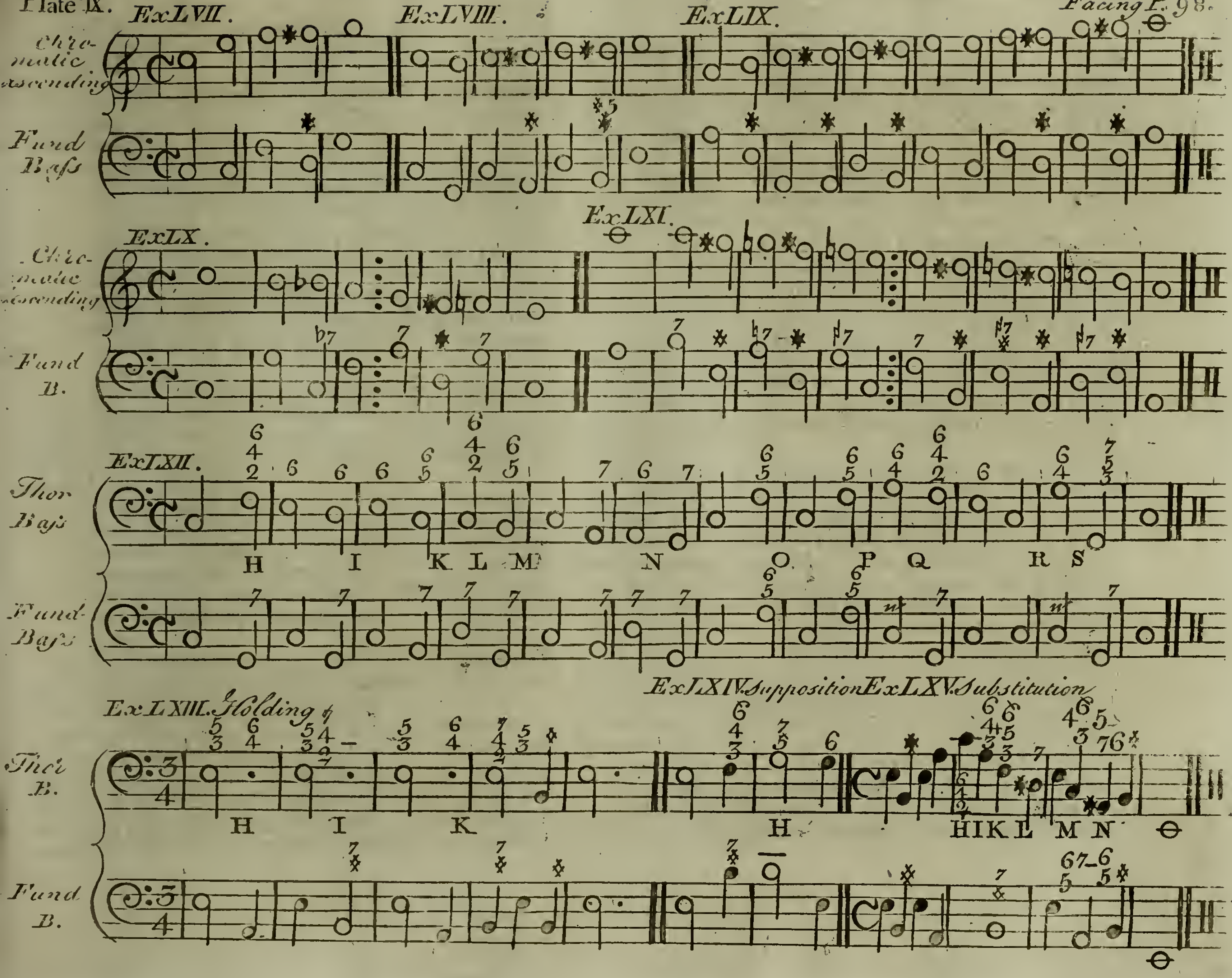
> The former of theſe is the limited courſe of the 5th in the leading chord of a regular cadence; the latter is the ſame in a ſequence of ſevenths. The fourth is generally left out in this chord, and it is then figured with 6 only, and paſſes as a I or at N, in Ex. LXII.

(5.) A baſs note, bearing a chord of the ſixth and fifth, may paſs into the next higher degree, bearing either a perfect chord, or a chord of the ſixth and fourth, derived from the fifth of the former baſs note; or it may paſs into the ſame fifth, bearing a perfect chord; or it may remain on the ſame degree, and take a chord of the ſecond.

> The firſt of theſe is the courſe of the third of the leading chord, in a regular cadence; the next is the irregular cadence; and the laſt is the preparation of a diſcord 7th, in the ſequence of ſevenths. See M, P, O, and K, in Ex. LXII.

(6.) A baſs note, bearing a chord of the ſixth and fourth, may either remain on the ſame degree till the ſixth and fourth

Plate IX.


Ex LVII.
Ex LVIII.
Ex LIX.
Chromatic ascending
Fund Baſs
Ex LX.
Ex LXI.
Chromatic descending
Fund B.
Ex LXII.
Thor Baſs
H I K L M N O P Q R S
Fund Baſs
Ex LXIII. Holding
Ex LXIV. Supposition
Ex LXV. Substitution
Thor B.
H I K
H
H I K L M N
Fund B.

have deſcended, and become fifth and third; or it may deſcend at the ſame time into the next lower degree, bearing a chord of the ſecond.

This reſtriction is owing to the propenſity of the mind to conceive the loweſt ſound we hear to be the fundamental, if the progreſſion will admit of it, and if the accompanyments can be reconciled to it as ſuch. In the preſent caſe, the 6th and 4th are eaſily taken as ſuſpending the 5th and 3d; and hence ariſes the neceſſity of their deſcending as deſcribed above. See S and Q in Exam. LXII. The directs in the fundamental baſs ſhew the enterance of the fundamental notes, by way of anticipation.

(7.) The movement of the thorough-baſs muſt not imitate any of the more familiar fundamental paſſages, ſuch as the riſing or falling of a fourth or a fifth, *&c.* unleſs the ſame paſſages either be in the fundamental baſs, or at leaſt might naturally be inſerted there.

This reſtriction is alſo owing to the deſire of hearing the fundamental ſounds in the baſs; ſo that when the baſs imitates any familiar fundamental paſſage, we expect accompanyment conformable to it. Thus the riſing of a fifth at R, in Exam. LXII. obliges us to conſtitute the next note a fundamental, as ſhewn by the direct.

295. A few licences are allowed between the plain thorough-baſs and the fundamental; which are reducible to three claſſes, called *holding*, *ſuppoſition*, and *ſubſtitution*.

Holding is practiſed only upon the key note, while the fundamental moves from the ſame key upon either or both of the adjuncts, and returns back to the key again: in which caſe the adjunct 4th bears only a perfect chord, which makes ſixth and fourth to the key; and the adjunct 5th bears a ſeventh, but the octave of the fundamental is omitted, which makes a *greater ſeventh fourth and ſecond* to the key, and this is a chord not formerly ſpoken of in this treatiſe. See the end of Art. 188. Theſe paſſages are ſhewn at H, I, and K. in Ex. LXIII. in the flat ſeries of E.

In this, and all other paſſages, where two or more chords are to be ſtruck to one continued note, the ſeveral chords are marked over the note; and to know the preciſe time when each chord is to be ſtruck, it muſt be obſerved, that when the note naturally divides into as many equal parts as there are chords figured over it, they muſt be ſtruck at each diviſion: but if only two chords be marked over a pointed note, which naturally divides into three parts; or if three chords be marked over a plain note, which naturally divides into four parts, the firſt chord muſt be continued on the two firſt parts; except this mark [—] be found among them, which ſtands inſtead of a repetition of the preceding chord, and is called a *continuation*.

296. *Suppoſition*, (or placing below) is when the thorough-baſs takes the third below the fundamental, and may be practiced in all ſorts of fundamental chords; but there is only one caſe wherein the chord thereby introduced differs from thoſe already ſpoken of. This ſuppoſition below a perfect chord, or below a chord of the ſixth and fifth, produces a chord of the ſeventh. The ſame ſuppoſition below a chord of the ſeventh, when the third of that chord is a perfect fifth to the ſuppoſed baſs, introduces a chord conſiſting of a ninth, ſeventh, fifth, and third; which chord is ſeldom ſtruck full: and if the ninth be omitted, it becomes a chord of the ſeventh; If the ſeventh be omitted, it becomes a chord of the ninth, as in Art. 188. N° 11.; and if the fifth be omitted it becomes a chord of the ninth and ſeventh, as in Art. 188. N° 15.

If the third of the fundamental chord be a ſuperfluous or ſharp fifth to the ſuppoſed baſs, which happens in ſuppoſition below the leading chord of a flat key, it introduces a new ſpecies of chord, conſiſting of a ninth, greater ſeventh, ſharp fifth, and leſs third, which is called a chord of the *extreme ſharp fifth*. The ſeventh is generally omitted to avoid the too great complication of diſcords, and when the chord of the key ſucceeds, the ſharp fifth aſcends, and the ninth deſcends, (which are their proper courſes) while the baſs continues upon the ſame degree, taking a chord of the ſixth: as at H, in Exam. LXIV.

297. *Subſtitution* is a term appropriated to the taking the leſs 6th, inſtead of the 5th of a flat ſeries, either in the baſs or in any of the upper parts; and this produces ſeveral chords which we have not formerly had occaſion to ſpeak of.

(1.) By ſubſtituting the 6th of a flat ſeries in the baſs, inſtead of the leading 5th bearing a ſharp third and ſeventh, we have a chord conſiſting of a ſixth, tritone, and *extreme ſharp ſecond* (or trihemitone,) as at H, in Exam. LXV.

(2.) The ſame ſubſtitution in an upper part produces a flat third inſtead of a ſecond, in the chord of the ſecond, which belongs to the deſcending 4th of the ſeries, as at I: alſo a falſe fifth inſtead of a fourth, in the chord of fourth and third, which belongs to the 2d, as at K: and an *extreme flat ſeventh* inſtead of a ſixth, in the chord of the ſixth and fifth, which belongs to the leading ※7th, as at L.

All theſe being borrowed from the leading chord of a regular cadence, will, like the original chord, be followed by the perfect chord of the key.

The like alterations may be produced in all other chords which include the 5th of the flat ſeries, by *ſubſtitution*; but it being ſeldom practiced, except in the chord of the adjunct 5th, and its inverſions, as above, we ſhall not here enumerate any other of this ſpecies.

298. There is another licence concerning which the theoriſts have been divided in regard to its origin, or fundamental: it will be beſt conceived as a ſecond kind of ſubſtitution, which takes place in the chord of the adjunct 4th of a flat ſeries, by taking the ※4th inſtead of the natural fundamental in a gradation on the 5th. This ſubſtitution alſo introduces a new ſett of chords all of them containing *extreme intervals*; for inſtance, if the ſubſtituted ※4th be in the baſs, the chord will conſiſt of either an *extreme flat ſeventh*, or a leſs ſixth, joined with a falſe fifth, and *extreme flat third*, as at N, in Exam. LXV. If the flat 6th be in the baſs, and the ※4th in an upper part, the chord will conſiſt of an *extreme ſharp ſixth*, with either a fifth, or a tritone, and a greater third, as at M. This laſt chord has been called the *Italian ſixth*; probably becauſe they firſt introduced it. Each of theſe chords will be followed by the adjunct 5th.

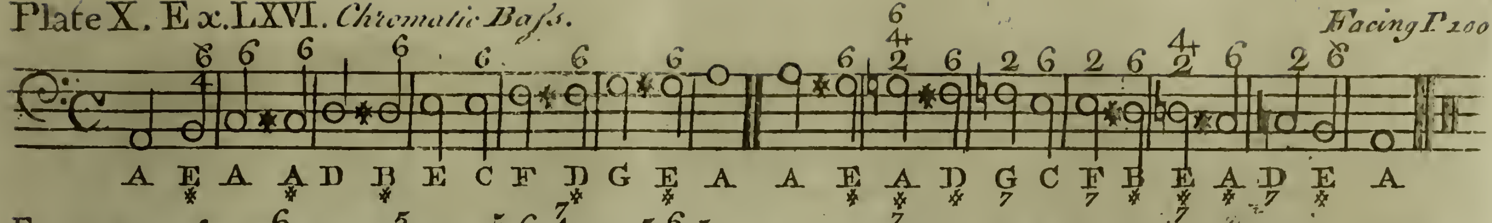
299. The thorough-baſs, as well as any other upper part, may take in the paſſages of chromatic, as deſcribed in the laſt chapter; and in this caſe the proper figuring will be obvious, from the conſideration of the fundamental progreſſion, and the inverſions which take place. See Exam. LXVI.

300. After a little practice in compoſition the real fundamental of every chord will become familiar, without formally extending the fundamental baſs below; which being of no other uſe, but to ſhew the ſucceſſion of chords in the harmony, may be omitted, as ſoon as the want of it can be ſupplied by the imagination: and in order thereto it will be proper for the learner to practice the ſubjoining of the fundamentals in letters below any figured thorough-baſs, according to the ſpecimens, Exam. LXVI. LXVII. and LXVIII.

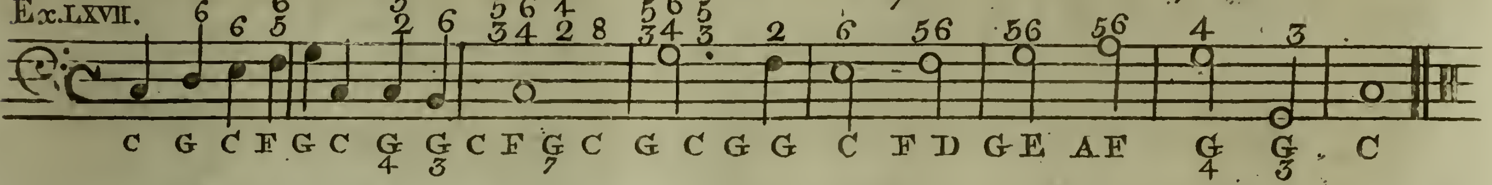
301. The movement of the thorough-baſs with reſpect to the treble muſt be regulated according to the following directions.

(1.) A conſecution of perfect concords of the ſame kind muſt always be avoided, when the parts move; but they may ſtand ſtill and repeat any concord, or even a diſcord ſeveral times over, while the fundamental remains the ſame. The

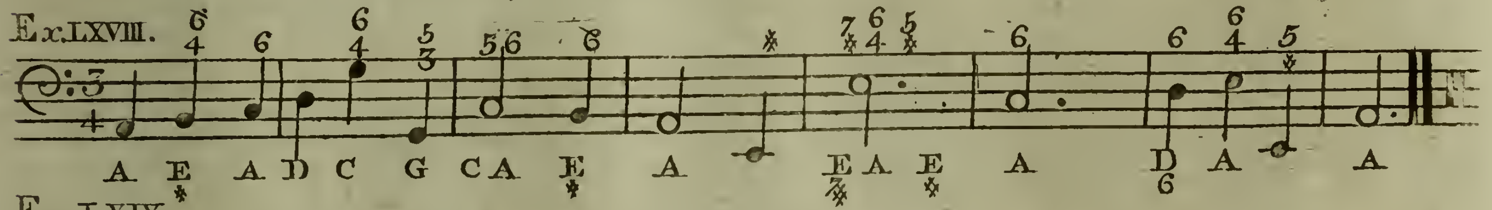
Plate X. Ex. LXVI. *Chromatic Baſs.*



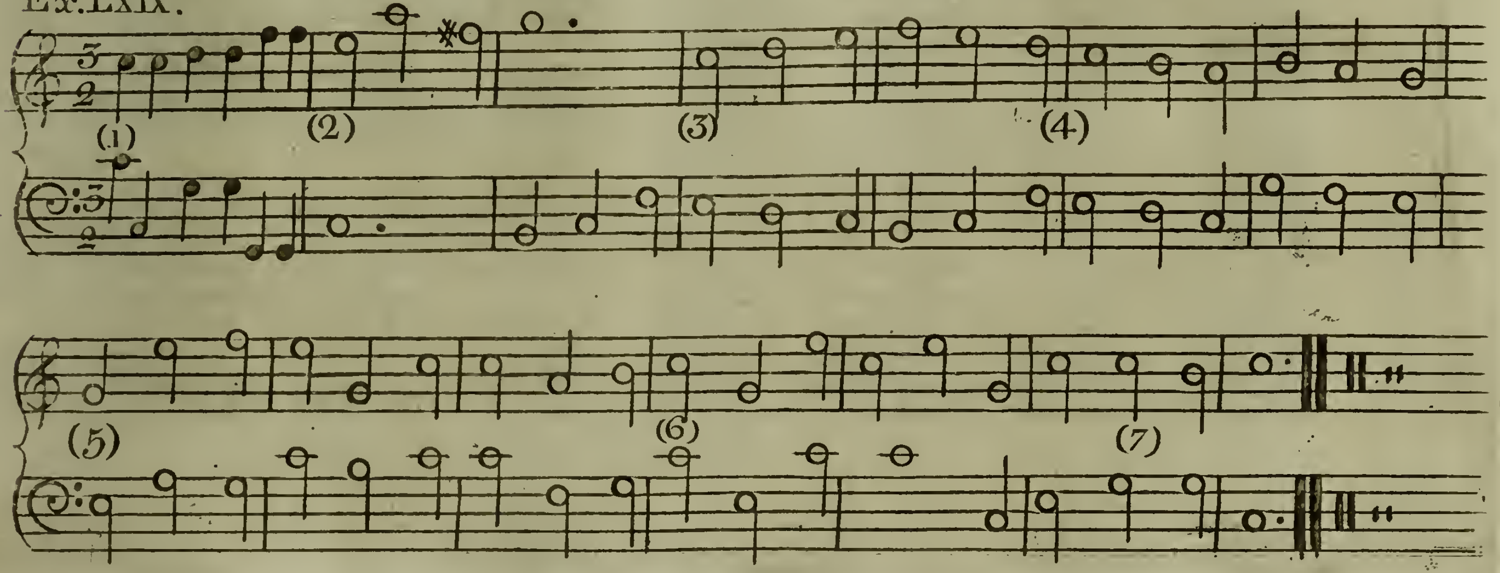
Ex. LXVII.

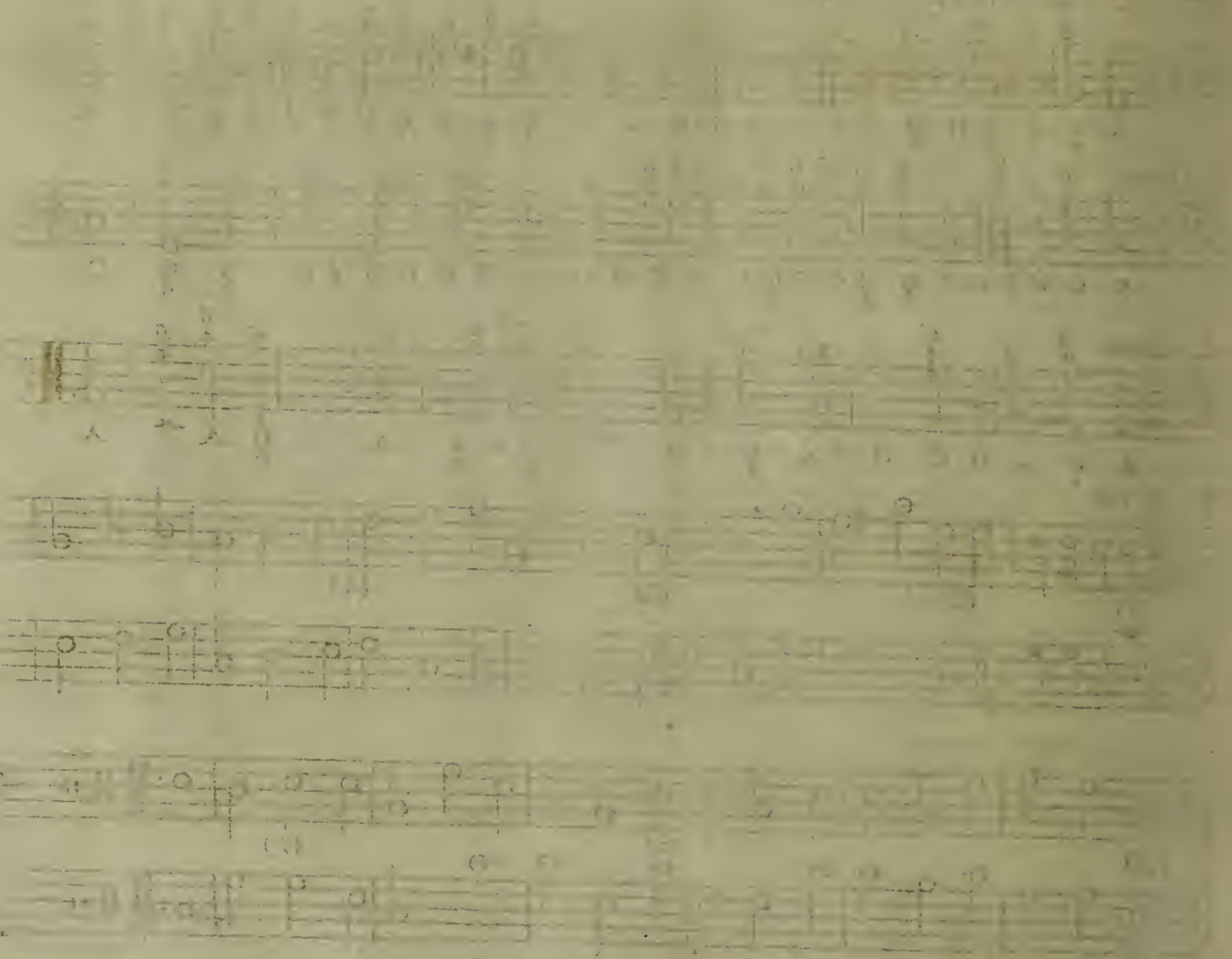


Ex. LXVIII.



Ex. LXIX.





leaping an octave up or down is conſidered the ſame as ſtanding ſtill.

(2.) While one part ſtands ſtill, the other may take any motion which is conſiſtent with the fundamental harmony.

(3.) When both parts move, they ought to take contrary motions as often as is convenient; that is, the baſs ought to aſcend while the treble deſcends, and *vice verſa:* and this either by degrees or leaps; the variety thereby introduced having always a good effect.

(4.) Both parts may aſcend or deſcend together by ſingle degrees, or by ſmall leaps, in a ſucceſſion either of thirds or ſixths, as far as ſuch a ſucceſſion does not interfere with the other rules of harmony; but ſeldom by any leaps larger than a fourth.

(5.) Both parts moving the ſame way by leaps of any kind, except in the caſe of ſucceſſive thirds or ſixths, as above, ought to be avoided, when the fundamental changes; unleſs the leaps be in ſome manner eſſential to the air of each part. Such paſſages always make a breach in the harmony, and are beſt allowed when the baſs takes a fundamental cadence, while the treble leaps a third or ſixth.

(6.) When the fundamental ſtands ſtill, both parts may take any leap which the chord allows, provided they do not meet upon and double the third of the fundamental, or the diſcord, if it bear one.

(7.) The baſs muſt not take a note to which the treble ſtands in the relation of a fourth, unleſs that fourth deſcend one degree when the chord changes: except in the chord of ſeventh fourth and ſecond, when the baſs holds upon the key, for here the fourth may aſcend on occaſion.

Theſe ſeven rules are ſucceſſively applied, in Ex. LXIX.

(8.) A note which is a diſcord to the fundamental, or which reſolves a preceding diſcord, muſt not be doubled. Neither ought the third or fifth of the fundamental to be doubled, except it be to favour the contrary motion of the parts, or when the ſame third or fifth might eaſily be admitted as a fundamental at that occurrence.

(9.) Imitations, as deſcribed, Art. 246. and fugues, deſcribed, Art. 124. are always agreeable, when different parts can be made to fall ſucceſſively into them: there is alſo a beauty called *inverted imitation,* where the deſcent in one part bears ſome reſemblance to the aſcent in another, and *vice verſa;* alſo another called *recte & retro,* in which one part is made to repeat backward, what another part has already done forward.

All theſe varieties are eaſieſt introduced in figurative deſcant, where the compoſer can avail himſelf of ſeveral liberties, not yet ſpoken of, to anſwer his deſign; yet as ſomething of the ſame kinds may be practiſed even in plain deſcant, it is proper to have them in view.

(10.) If no more parts than a firſt treble and baſs are intended, a good ſhare of melody may be given to the baſs, and fugues, imitations, and ſequences of thirds or ſixths, freely admitted; eſpecially in inſtrumental muſic; (for the baſſes to ſongs ought to be ſimple, that the attention may not be drawn off from the ſinger;) but if a ſecond treble is to be added, it is beſt to reſerve the greateſt ſhare of theſe beauties for that part, and confine the baſs more cloſely to the fundamental progreſſion: and for this purpoſe, when they occur to a compoſer, it will often be proper to put them down immediately in the ſecond treble, and afterwards join a baſs to both trebles.

302. The ſecond treble and tenor ought generally to be ſo conducted as to fill up the ſucceſſive chords as much as is convenient. For as every perfect chord contains three different ſounds, and every diſſonant chord four, there will always be one ſound in a perfect chord, which neither the treble nor baſs takes, and which therefore one of theſe parts ought to

take, while the other coincides with any part whoſe ſound can admit of being doubled; and there will be two ſounds wanting in a diſſonant chord, which theſe two parts ought to ſupply. For inſtance, if the baſs take G, bearing a perfect chord, while the treble takes D (the fifth,) there is ſtill B (the third) left for one of theſe parts, while the other may take the octave of the baſs: and if the baſs take F, bearing a chord of ſixth and fifth, while the treble takes C (the fifth,) there will ſtill be D (the ſixth,) and A (the third,) left for theſe inner parts to ſupply, if it can be brought about without tranſgreſſing any of the following rules.

303. Rules for the inner parts with reſpect to the principal parts, and to each other.

(1.) All the rules preſcribed, Art. 301. between the baſs and treble, ought to hold good between the baſs and any other upper part; but a tranſgreſſion of theſe rules is of leſs conſequence, according as the part in which it occurs is leſs the object of a hearer's attention.

(2.) The neceſſary motions in the reſolution of diſcords, muſt be ſtrictly complied with, in whatever part the diſcord is introduced; and ſuch diſcords as need to be prepared, muſt be prepared in the ſame part, and introduced by a continuation of the preparing note.

(3.) The ſecond treble ought in general to be kept below the firſt, and the tenor below the ſecond, but above the baſs: there are the natural places of the parts; and if at any time one of them go out of its natural place, the higheſt part is ſtill to be eſteemed the firſt treble, and the loweſt part the baſs, for the time.

(4.) The upper parts ought not to lye too far aſunder. In general the larger and more perfect intervals ought to be below in a chord, and the ſmaller and more imperfect, above. See Art. 127. and 133.

(5.) A conſecution of perfect concords of the ſame kind muſt be avoided between one upper part and another, as well as between each of them and the baſs. When the firſt and ſecond treble are made to go together, or the tenor to go on with the octaves of the baſs, for ſome time, ſuch occurrences are no exceptions to this rule; for in theſe caſes the two parts which coincide are conſidered only as one.

(6.) The rules preſcribed between the baſs and treble, in regard to doubling the harmonics of a chord, Art. 301. N° 8. ought alſo to be obſerved between one upper part and another; though a ſmall deviation from theſe rules, may be allowed among the inner parts.

304. For examples of plain deſcant the common ſetts of pſalm tunes in four parts may be taken; obſerving this peculiarity, that the church part, uſually called the *tenor*, muſt here be conſidered as the leading part, becauſe it contains the principal melody, and is beſt heard in the performance; ſo that it is properly a firſt treble carried an octave lower, in order to ſuit the generality of mens voices; and the part uſually called *treble*, which is adapted to womens and boys voices, is properly a ſecond treble in the deſcant; and the *contra* is the inner part.

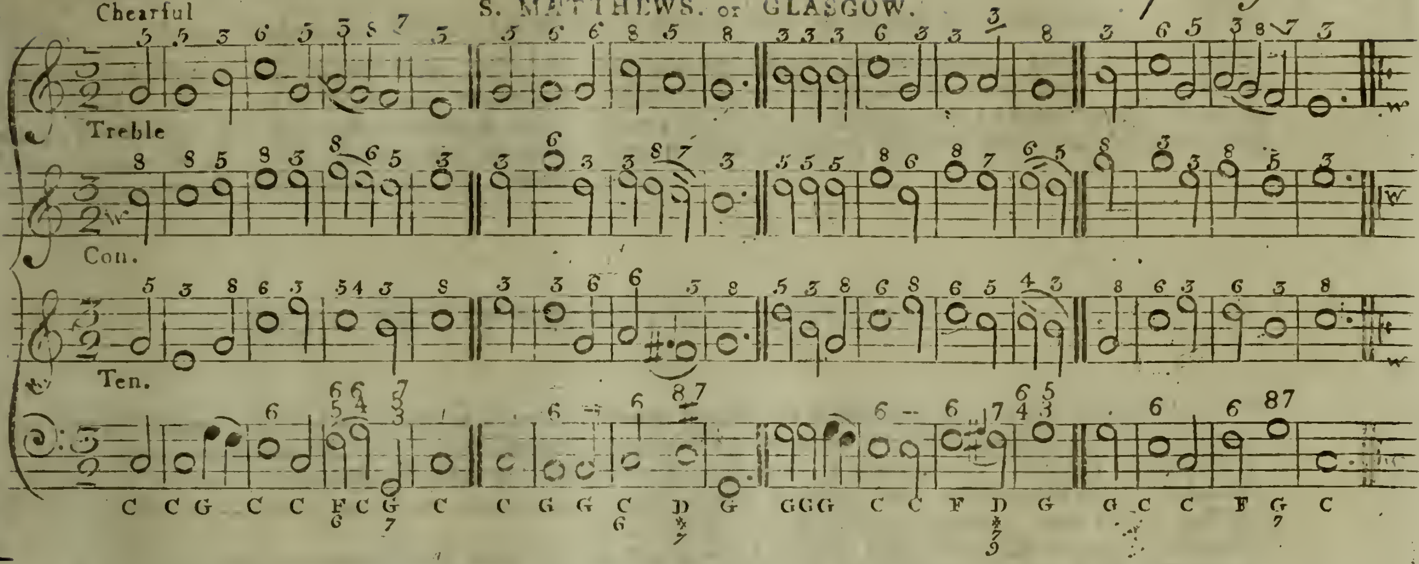
Exam. LXX. Plate XI. is a ſpecimen of this kind of compoſition, with the fundamentals ſubjoined in letters, and the relation of each note to the thorough-baſs marked over it, for the learner's peruſal.

305. The ſequence of ſevenths, as deſcribed, Art. 249, and Exam. LII. when the thorough baſs keeps the fundamental progreſſion, requires four upper parts to make it quite full; but all the ſevenths are brought in by two parts, which take alternately the 3d and 7th of the fundamental chords; as will appear by inſpecting the example; while the other two parts fill up the 5th and 8th of each chord by turns: and the effect is much the ſame though one or both of theſe parts be omitted.

The thorough-baſs may take any of the parts of this ſe-

Plate XI. Ex.LXX. *facing P.102.*

S.t MATTHEWS. or GLASGOW.



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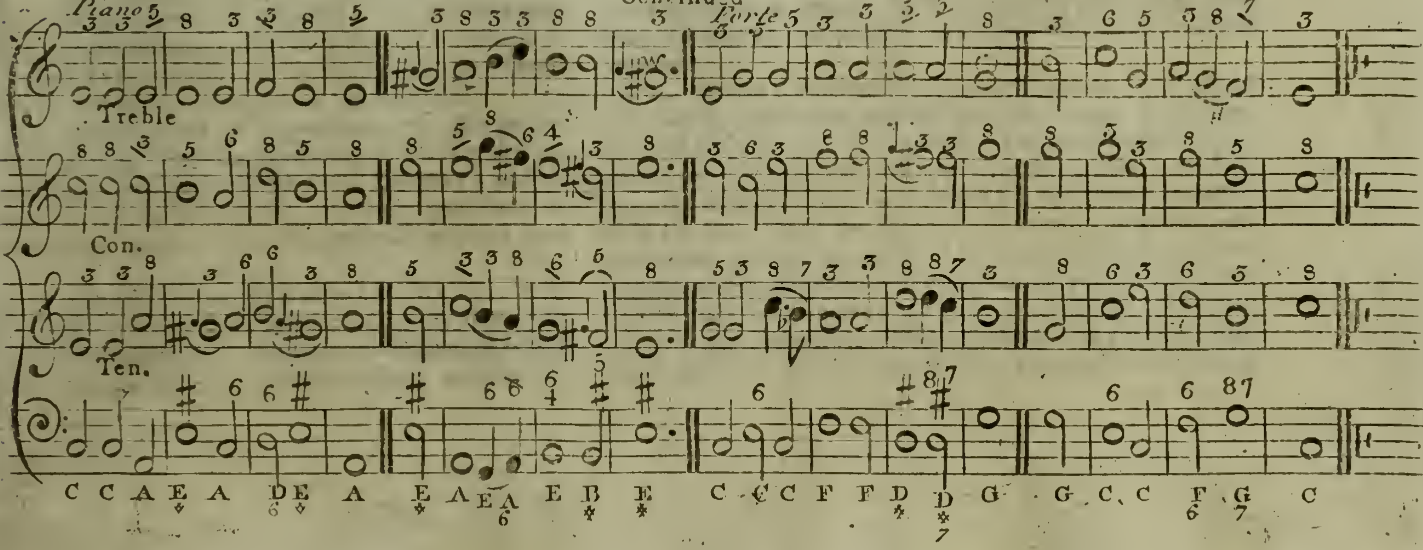


quence, bearing ſuch chords as are derived from the fundamental by inverſion: and if ſome of the diſcords be omitted, ſuch omiſſions give ſeveral liberties in the movement of the parts; from whence ariſe a vaſt variety of paſſages, all originally founded on the ſequence of ſevenths, which the ſtudious will obſerve in the courſe of practice; but it would be rather tedious to take a full account of them here. In all caſes the proper movement of the parts will be found out, as far as belongs to plain deſcant, by a careful obſervation of the foregoing rules.

CHAP. XII. *Of* FIGURATIVE MELODY.

Article 306. THE liberties allowed in compoſing a *figurative* or florid melody, from a plain melody and its baſs given or previouſly compoſed, of which we ſhall take a particular view in this chapter, are either *ſuſpenſions*, *ſubſtitutions*, or *breakings*.

307. The moſt uſual *ſuſpenſions* are deſcribed, Art. 113, and 114.: and it is to be obſerved in practice, that the ſuſpending notes muſt always be prepared; that is, they muſt be brought in as continuations of former ſounds: which are generally made to ſyncopate, and by that means the diſcords are introduced on the accented part of the meaſure.

308. The various kinds of ſuſpenſions muſt alſo be uſed with proper caution, that the ſuſpending notes may not imply fundamentals which are foreign to the harmony; and for this purpoſe it may be neceſſary to read over again from the 181 to the 187th article; with the applications which here follow.

309. The chord of the fourth is obſerved, Art. 181. to be "a mixture of the chord of the ſuſpending fourth along with "that of the fundamental:" therefore this ſuſpenſion is moſt properly uſed on the adjunct 5 *f*, both in ſharp and flat harmony, becauſe the ſuſpending note is the principal key. It is alſo eaſily allowed on the K *f*, becauſe the ſuſpending note is the adjunct 4th. Theſe are the chords to which this licence naturally belongs: but it may be uſed on all fundamentals, except the 4th in ſharp harmony, and the 2d and 6th in flat harmony, for the ſake of a regular ſucceſſion, or to favour an imitation of what is gone before; if the ſuſpending notes be found prepared; theſe ſuſpending notes in all caſes being allowed to take place as co-exiſtent fundamentals in the harmony.

310. Neither this chord of the fourth, nor any other chord diſſonant by ſuſpenſion, may be inverted, except when they are uſed in their moſt natural place. The moſt practicable inverſion of any chord of this ſpecies is that wherein the baſs takes the diſſonant note, *viz.* where the ſuſpenſion is practiſed in the baſs. But the chord of the fourth, being the moſt harmonious ſuſpenſion, admits of the greateſt liberties on that account; and therefore both its inverſions are practiſed in muſic.

The 5th *f* is the natural place of the chord of the fourth, and in this ſituation its inverſions produce the chord of fifth and ſecond, on the ſyncopated key, followed by the 7th of the ſcale; and that of ſeventh and fourth, on the 2d of the ſcale, followed by the ſixth and third, or ſixth fourth and third on the ſame note.

311. The chord of the ninth, Art. 182. tending to introduce the fifth of the fundamental as a co exiſtent fundamental, takes place properly on the K*f*, and on the adjunct 4th*f*, in both ſorts of harmony; becauſe their fifths may moſt naturally become fundamentals: but the ſame ſuſpending ninth is alſo uſed on any note whoſe fifth can be admitted as a co-exiſtent fundamental at the time, for the ſake of a regular ſucceſſion, if at the ſame time the ninth be prepared by being either a third or a fifth in the former chord; that is, if the baſs either aſcend by a

ſingle degree, or { aſcend a fourth / deſcend a fifth } from the former note.

The inverſion of this chord produces that of the ſeventh fourth and ſecond on the ſyncopated 2d of the ſcale, followed by the key bearing its perfect chord.

When theſe ſuſpenſions are practiced in the baſs the movement of the upper parts, in reſpect of the baſs, is by ſome authors called anticipation: but this ſeems to be a needleſs increaſe of technical terms.

Fxam. LXXI. Plate XII. is a ſpecimen of the uſe of both theſe kinds of ſuſpenſions, and their uſual inverſions, in both ſorts of harmony.

312. The chord of the ninth and fourth, Art. 183. which introduces the fifth of the fundamental with an added ſeventh, belongs properly to the K*f* only. The inverſion of this chord produces that of ſeventh fourth and third on the ſyncopated 2d of the ſcale, followed by the key with its perfect chord. The chord of the ninth and ſeventh, Art. 174. N° 3. ought to be ſparingly uſed on ſuch baſs notes as either really do ſtand, or at leaſt may be ſuppoſed to ſtand at the diſtance of a third below the fundamental, by way of ſuppoſition. See Art. 296. Therefore this chord belongs only to baſs notes whoſe thirds *may be* the *governing* fundamentals at the time. This and the following ſuſpenſions, ſeldom or never admit of inverſion.

N. B. All the *ninths* muſt be prepared as deſcribed, Art. 311.

313. The ſeventh ſuſpending the ſixth in deſcending, Art. 184. or the fifth ſuſpending the ſixth in aſcending, Art. 185. may be uſed on any baſs note which bears a chord of the ſixth, and has the ſuſpending note prepared: and when ſeveral baſs notes, gradually deſcending, bear each a ſixth, tho' their chords be, in other reſpects, differently formed, every ſixth may be held on and become a ſuſpending ſeventh in the next chord, and every baſs note may be accompanied with its third, for the ſake of a regular deſcending ſeqnence.

The aſcending ſequence of fifths and ſixths, being leſs natural, is more ſparingly uſed, and ſeldom continued on more than two or three baſs notes gradually aſcending.

314. The ſubſtitutions deſcribed, Art. 297. and 298. differ from ſuſpenſions in theſe ſeveral reſpects.

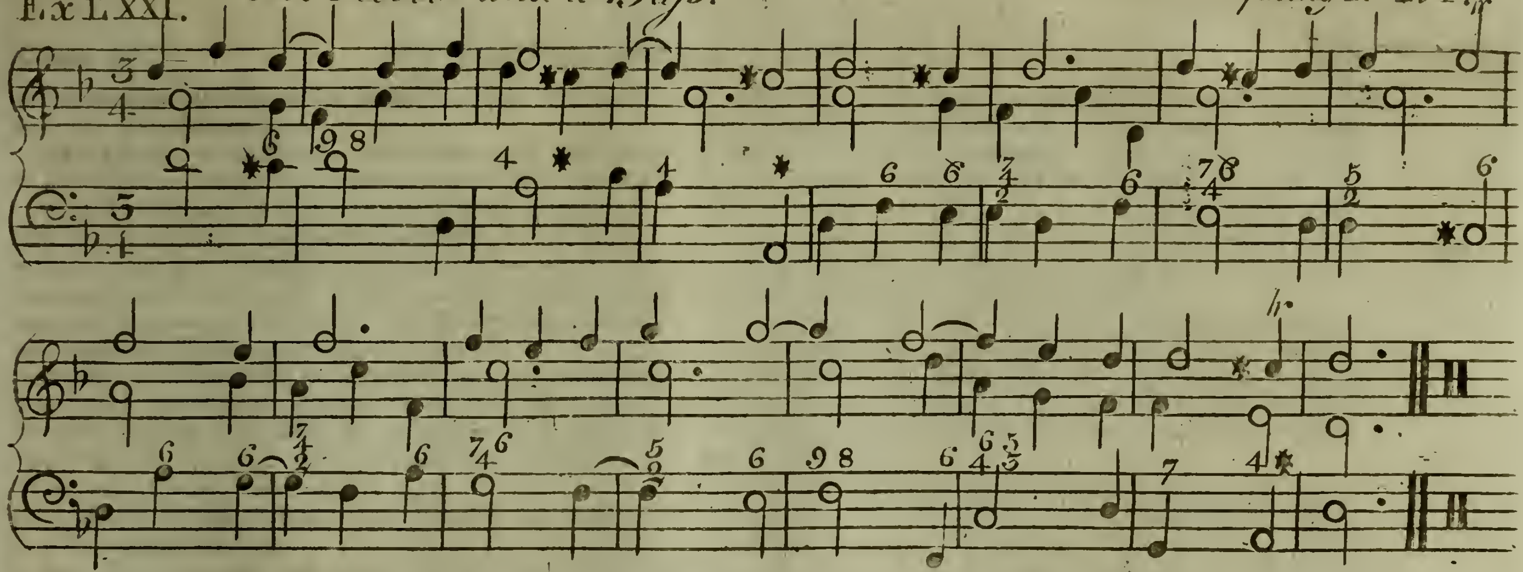
(1.) The ſubſtituted notes are generally introduced without preparation, and on the unaccented part of the meaſure, provided that the courſe of the melody lead naturally to theſe notes; whereas ſuſpending notes are generally prepared, and introduced on the accented part.

(2.) A chord, diſſonant by ſubſtitution admits of inverſions of all kinds, the baſs eaſily taking either the ſubſtituted note, or any other note of the chord; whereas diſſonances by ſuſpenſion are rarely inverted, except when the ſuſpending note is introduced in the baſs.

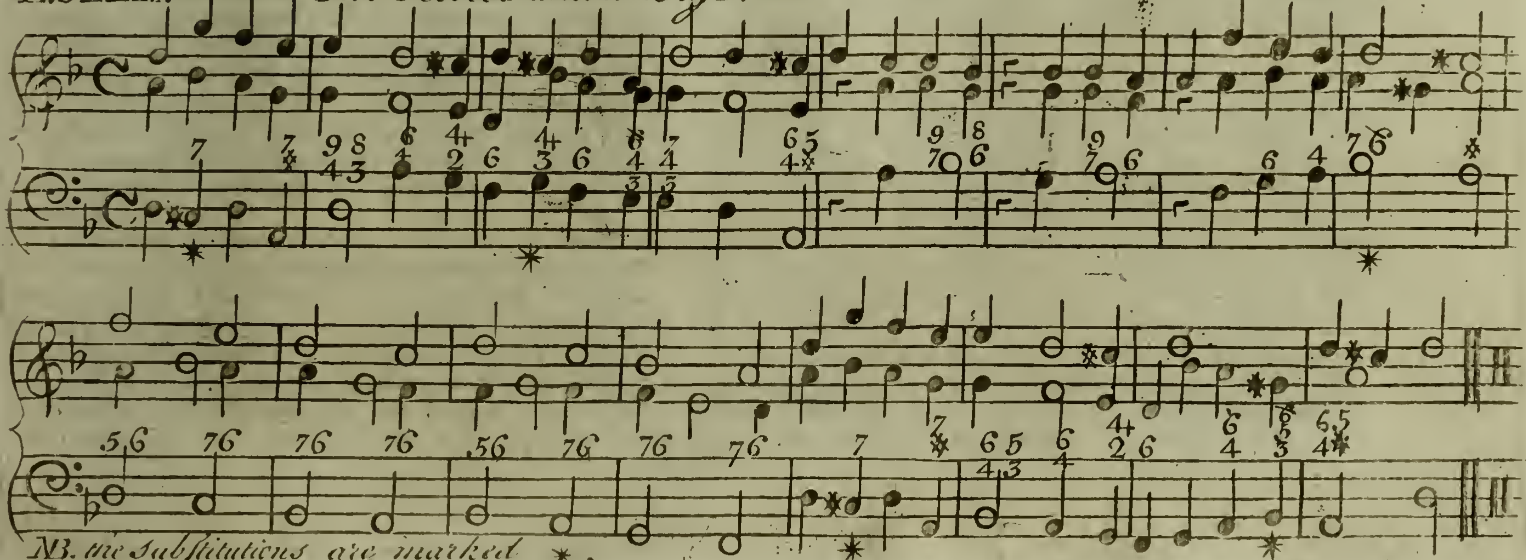
(3.) The ſubſtituted notes are limited in their progreſſion, on account of the diſcord which is to be reſolved, much like ſuſpending notes; but in ſubſtitutions the chord changes when the diſcord is reſolved, as it alſo does in the reſolution of fundamental diſcords; whereas in ſuſpenſions the chord re-

Plate XII.

Ex LXXI. *Two Trebles and a Baſs.*



Ex LXXII. *Two Trebles and a Baſs.*



NB. the Subſtitutions are marked *.

mains the ſame after the proper ſound has ſucceeded; that is, after the diſcord is reſolved.

Ex. LXXII. contains inſtances of the uſe of all the licences in this and the two preceding articles, in the flat ſeries of D.

315. In *breaking*, or ſubdividing a note of an upper part into ſeveral ſmaller ones, it muſt be obſerved, that if the fundamental chord, which exiſts at the time be perfect, we may break any note into as many ſmaller ones as we pleaſe, uſing none but the notes of the chord: but if the chord contain a diſſonance, and conſequently ſome of its ſounds be reſtricted in their motion, care muſt be taken, that if the figurative melody touch upon one of theſe reſtricted notes, it may be heard reſolved in the ſame part, when the chord changes: and if the figurative melody touch upon two reſtricted notes in one chord, the latter of theſe muſt be heard reſolved in the ſame part, when the chord changes. Such breakings are called *diviſions by conſonant intervals.*

316. When the plain note which is to be broke is itſelf the diſcord to the fundamental, or is reſtricted in its motion, on account of the reſolution of a diſcord, care muſt be taken that the firſt part of the diſcording (or reſtricted) note may be diſtinctly heard; and after the remaining part of it has been broke into ſmaller notes, the diviſion muſt lead naturally into the proper reſolving note, that it may alſo be diſtinctly heard.

316. In making the ſame kind of diviſions by conſonant intervals in the thorough baſs, the following cautions are alſo neceſſary.

(1.) It often happens, that in ſubdividing the notes of a plain baſs, we introduce a neceſſity of ſtriking the chords more frequently with the right hand; as for inſtance, when a minim is broke into four quavers, it is natural to expect a chord to be ſtruck once to the firſt, and again to the third quaver; or, as the artiſts ſay, *the third quaver will bear a chord:* and therefore we muſt take care that ſuch parts of the diviſion as bear chords, may not counteract the original courſe of the harmony, by introducing inverted chords of a tendency different from that of the plain baſs. Thus, becauſe the chord of the ſixth and fourth, belonging to the 5th above a fundamental, requires to be followed by the perfect chord of the ſame baſs note; therefore, in ſubdividing a thorough-baſs note, we ought not to place the 5th of the fundamental where it will bear a chord, unleſs the ſame note be to follow, with its own proper chord. See Art. 294. N° 6

(2.) We muſt alſo take care, that all the fundamental cadences, which take place in the plain baſs, be alſo diſtinctly perceived in the figurative baſs; for theſe are the paſſages which characterize the baſs; and in ſuffering them to paſs unperceived, we ſhould rather make a *new baſs* than a *variation* on the original.

A cadence will be diſtinctly perceived, if the figurative baſs either take the real notes of the cadence, or one of the motions called neceſſary in the cadences; as formerly deſcribed, Art. 196. and 211: But, in general, the figurative baſs coincides with the plain baſs in ſuch occurrences; and eſpecially in the cadences which conclude the principal phraſes or ſtrains of the piece.

318. Any note, either of the baſs, or an upper part, may be broke into a ſucceſſion of ſmaller notes, moving by ſingle degrees only, provided that ſucceſſion begin with the note itſelf, or, at leaſt, one of the notes of the chord which takes place at the time, and lead naturally into the note which is to follow; or if the laſt note of the ſucceſſion be a leap diſtant from that which follows, this laſt note muſt alſo be one of the notes of the chord; or if a leap occurs in the middle of the ſucceſſion, both the notes of ſuch a leap muſt belong to the chord. Theſe breakings are called *diviſions by paſſing notes.*

319. Taſte obliges us ſometimes to depart from the rule preſcribed above, in regard to the firſt note of a diviſion by paſſing notes; and alſo in regard to the note which follows a leap in the middle of ſuch a diviſion, this being, in effect, the

firſt note of a new ſucceſſion: but then, if theſe notes do not belong to the chord, they paſs either as ſuſpending or ſubſtituted notes; and therefore muſt be immediately followed by one which does belong to the chord, and which alſo ſerves for a proper reſolution of the preceding diſcord, according to the rules formerly laid down.

320. When ſeveral breakings follow each other in regular order, the deſire of imitations often obliges us to tranſgreſs all the rules which can be given; but then it is to be obſerved, that the firſt of ſuch breakings muſt always be conformable to the above rules; and it is eaſy to perceive when the attention begins to be carried away by an imitation, that is, when the rules may and ought to be ſet aſide, in compliance therewith.

321. It is uſeful to obſerve, on this ſubject, that greater liberties may be taken in the breakings of ſome chords than others: Thus in the chords of the K*f*, and of the 5th *f*, we can allow of ſeveral paſſages which would not be ſuffered in chords more diſtantly related to the principal; and this will eaſily be accounted for, by obſerving, that moſt of the ſuſpenſions and other licences, formerly deſcribed, naturally take place in the chords of the K*f*, and of the 5th *f*. So that here almoſt any ſucceſſion of notes will paſs. A whole tune is often in reality no more than a kind of diviſion or breaking upon the key note as fundamental. The key might be held on in the baſs from firſt to laſt, as in the muſette and bag-pipe muſic; and although it ſhould not actually be ſo held on, yet it is undoubtedly always kept in mind in all connected pieces.

322. When ſeveral parts are ſet together, if one of them be divided into ſmall notes, that part, ſo ornamented, ought generally to be conſidered as the leading part, or principal melody, for the time, and it is proper that the other parts at the ſame time be plain, or that at moſt only two of the parts go on in diviſions together, as firſt and ſecond trebles; to avoid the diſtraction which would inevitably follow, if too many objects were to demand our attention at once.

323. The inſertion of reſts or pauſes in one or more of the parts, which are ſet together in muſic, may be properly ranked among the liberties of figurative melody. Theſe, when judiciouſly uſed, ſerve greatly to diverſify the harmony; and in this matter the taſte of the compoſer ſeems to be confined to no other rules, except that when a reſt is put in any part immediately after a diſcord, or any other note reſtricted in its motion, the proper reſolving note, which was expected in place of the reſt, muſt inevitably follow: and when a reſt is put in the baſs, the note which follows will require a chord to be ſtruck with it, or will *bear a chord*, though it ſhould be in an unaccented part of the meaſure; therefore the ſame caution is neceſſary in this caſe which was given in regard to the divided baſs, Art. 317. N° 1.

324. There is no occaſion to adduce any examples of theſe diviſions here, becauſe all our modern compoſitions abound with them; and he who examines muſic, ſet in ſcore, with a due regard to the fundamental principles, cannot fail of meeting with abundance of inſtances which will aptly exemplify each of the rules delivered above; ſo that, with a ſmall degree of attention, every piece of muſic which the ſtudent either practiſes or hears, will tend to confirm the principles laid down in this eſſay, and to fix them more durably in his memory.

325. In caſes where it may be doubtful whether a note belongs to the plain melody, or is a paſſing note; which ambiguity will often occur where the baſs is not figured, the doubt will be beſt decided by trying whether ſuch a note may be left out, and yet the air of the tune remain the ſame; for if this be the caſe, it may ſafely be eſteemed a paſſing note: but if the air be altered, or the connection interrupted, by leaving out ſuch a note, it is a ſure proof that it ought to have place in the plain melody. The ſame method ought to be taken when a baſs is to be ſet to a given figurative melody; for, by

this means, the plain melody may be aſcertained, and the baſs ſet to it, by the rules already given.

326. To finiſh this chapter, it ought to be obſerved, that the liberties which we have claſſed under the article of figurative melody, when judiciouſly uſed, contribute more than any thing formerly ſpoken of towards heightening the *expreſſion* of muſic. Thus, the diviſions by conſonant intervals are gay and ſprightly when very quick, and are bold and majeſtic when a little ſlower. The diviſions, by paſſing notes, are pleaſant and airy when quick, and are ſoft and pathetic when ſlower. The diviſion, beginning with a note which does not belong to the chord, has a particular affinity to the modulation of the voice in ſpeech, and eſpecially in the language of the Italians, from whom we have borrowed it; and is remarkably tender and affecting: the occaſional inſertion of reſts, ſometimes expreſſes diffidence or ſuſpence; but reſts ſerve to heighten every ſpecies of pathetic expreſſion. From theſe hints, joined with ſuch other remarks as the judicious will not fail to make in the courſe of practice, it will eaſily be obſerved, that the ſame fundamental progreſſion may receive a vaſt variety of melodies, which may differ widely one from another; ſo that one ſhall be plaintive, another chearful; one grave and majeſtic, another light and airy, *&c.* according to the different movement and manner of dividing the melody. Thus we frequently find the very ſame progreſſion in a ſolemn Pſalm tune, and in a joyous catch.

327. It may alſo be remarked, that melody takes a conſiderable tincture from the cuſtomary cadences of a language, ſo that there are *national melodies* in a manner peculiar to different countries, which are eaſily diſtinguiſhed one from another; and that although the fundamental progreſſion itſelf has a ſhare in this diverſity, the moſt ſimple and natural progreſſions being moſt cloſely adhered to where muſic is leaſt ſtudied and cultivated; yet the peculiar manner of ſubdividing the plain notes is the principal cauſe of theſe differences.

328. The ſtudious practiſer will alſo perceive, with ſome regret, that the deſire of exhibiting ſurprizing execution has led ſeveral modern maſters, who otherwiſe have unqueſtionable merit, to inſert diviſions which rather detract from than add to the real beauties of their compoſitions.

This fault is moſt conſpicuous in the modern ſongs. Theſe being intended to make their firſt appearance in ſome of our public places of diverſion, muſt, of courſe, be adapted to the abilities and manner of a particular ſinger, and ſcope muſt be given to the ſinger to exhibit all her (or his) power of voice, in trills, diviſions, *&c.* though the ſentiment cannot properly admit of any ſuch paſſages at all. Thus true melody and good ſenſe are often ſacrificed to gratify the vanity of a performer; and when that performer diſappears, the favourite ſong alſo vaniſhes of courſe.

329. The fancies of compoſers are ſo unbounded, and their thirſt for variety ſo inſatiable, that the reader ought not to be ſurprized, if he ſometimes meet with paſſages which cannot be perfectly reconciled to any of the rules delivered above: much leſs ought he on ſuch occaſions to be haſty in cenſuring either the irregularity of the compoſer, or the imperfection of theſe rules. Under the title of rudiments of practical muſic he may juſtly expect to find all ſuch rules as beginners ſhould confine themſelves to, in order to correct the irregularities of their fancies; and in this view it is hoped the preceding treatiſe will be found to have ſome merit: but then it muſt be conſidered, that the expert maſter in muſic, as in the ſiſter arts of poetry and painting,

——— *may glorioſly offend,*
And riſe to faults true critics dare not mend.

We ſhall therefore conclude this part with adviſing the reader, when he has advanced thus far, not to ſtop here, and imagine himſelf an adept in muſic; but to endeavour, by a frequent peruſal, and careful examination of the works of eminent compoſers, particularly ſuch as are printed in ſcore, to improve the hints and inſtructions here given, and to familiarize and perfect the ideas which, from a curſory reading of a treatiſe of this kind, can at beſt be but indiſtinctly conceived.

PART

PART II.

The THEORY of MUSIC.

CHAP. I. *Of Single* MUSICAL SOUNDS.

Article 1. THE deſign of a *theory of muſic*, is to explain the nature and properties of *muſical ſounds;* and from thence to deduce ſuch remarks and directions as may be uſeful in the compoſition of muſic, in the ſtructure or the tuning of muſical inſtruments, or which may tend, in any reſpect, to the improvement of the art.

We have no reaſon to deſpair of ſucceſs, in the purſuit of a ſatisfactory theory of muſic, if we ſet out in the right way; for, however ſtrange in may ſeem, it is certainly true, that the moſt part of the difficulty and dryneſs which is juſtly complained of in the ſtudy of this ſcience, is owing to the want of right principles to proceed upon, and the laying too great ſtreſs upon circumſtances of little importance, while others of the greateſt conſequence are almoſt, or altogether, diſregarded.

To account for this, it ſeems neceſſary to ſuppoſe, that ſeveral of thoſe authors who have been beſt verſed in the mathematics, and moſt intent on determining the effects of muſic by its rules, have beſtowed their labour on wrong materials, for want of ſufficient practice in muſic, whereby to aſcertain what were the moſt important particulars to be enquired into: and that others, though better qualified in this reſpect, have yet adopted erroneous principles, without ſubmitting them to accurate tryal; and by proceeding upon them have been diſappointed and chagrined at the manifeſt inconſiſtencies between the theory and the practice, in ſeveral reſpects, and the inſufficiency of the theory for eſtabliſhing, upon ſatisfactory principles, many rules which are found indiſpenſibly neceſſary in practice.

2. We ſhall in the following eſſay narrate, as briefly as poſſible, thoſe properties of ſound which ſeem neceſſary to be taken notice of, and which have been fully diſcuſſed by other authors; but ſhall more largely treat of other properties which have hitherto paſſed almoſt unobſerved, and which ſeem to conſtitute a very eſſential part of the theory of muſic: ſuppoſing all along that the reader is well acquainted with the common operations of arithmetic, and with the particulars treated of in the firſt part of this book.

We ſhall firſt lay down the properties of muſical ſounds, conſidered both ſingly and in ſucceſſion: ſecondly, the properties of chords, or combinations of muſical ſounds: and, thirdly, give ſome ſpecimens of the uſe and importance of theoretical knowledge.

3. Sound is produced by (or always accompanied with) a vibratory, or undulatory motion of the air, firſt impreſſed on the contiguous air by the vibrations of a ſounding body, and ſucceſſively propagated through the air, towards all parts. This undulatory motion agitates the tympanum, or *drum* of the ear; by which means a like motion is communicated to the air contained in that organ, which, being carried to the auditory nerve, excites in the mind the idea of ſound: this we call *hearing* a ſound.

4. If the vibrations or pulſes of a ſound ſucceed each other at equal intervals of time, the ſound is muſical, but not otherwiſe: and the hearing of a ſound whoſe vibrations are equal timed, conveys to our mind the idea of a determinate *pitch* or *tone*.

5. The acuter or higher any ſound is, the quicker are its vibrations; and contrariwiſe, graver or lower ſounds have ſlower vibrations: and becauſe the quicker any equal-timed vibrations are, the greater number of them will be made in a given time; therefore one muſical tone is higher than another, if it make a greater number of vibrations in a given time; and contrariwiſe And it is by the numbers of vibrations made in the ſame time, that we propoſe to compare ſounds one with another.

6: It concerns us very little to enquire whether the vibrations here ſpoken of, which occaſion each particle of air to move ſucceſſively forward, and back again, through very ſmall ſpaces, be the immediate cauſe of ſound; or whether that cauſe ought not rather to be attributed to ſome more minute motion or trembling of the particles themſelves. We have all the reaſon which the ſubject is capable of, for concluding from the analogy with our other ſenſes, that ſound is a motion of ſome kind, and that if it be not thoſe very vibrations, yet it is ſome motion inſeparably connected with them, and proportional to them; ſo that we may ſafely take the proportions of the vibrations as the proportions of muſical ſounds; eſpecially when the concluſions drawn from thence are found agreeable to experience.

7. Every muſical ſound has one principal or total vibration, by which we eſtimate its tone, and alſo ſeveral other ſubordinate or partial vibrations exiſting along with it, which produce a combination of ſounds, as obſerved, Part I. Art. 137. which are there called the *natural conſonances* of a muſical ſound. Theſe natural conſonances conſiſt wholly of ſounds, which are acuter than that of the principal vibration; and among them thoſe ſounds, whoſe vibrations coincide moſt frequently with the principal vibration, are generally found to be predominant; but this depends on accidental circumſtances which it will be worth our while to examine a little.

8. That the air can receive a great number of different vibrations at once, and properly comply with each of them, we are aſſured from daily experience, by the multiplicity of ſounds we frequently hear at the ſame inſtant, and each of them as perfect in its kind, as if no other interfered with it: and the moſt familiar way of accounting for this is by compariſon with the waves on the ſurface of a pond of water; for, if ſeveral waves be raiſed at different places, and of different ſizes, we may obſerve them to meet, and paſs over, and intermix with each other, without ſuffering the leaſt alteration as to their ſize, direction, or velocity; ſo long as their motion continues to be perceivable. Here the ſurface of the water properly complies with all the different waves as they paſs, and the motion of each ſmall particle is the reſult of all the various motions which the ſeveral waves would ſingly produce, compounded together. Now, the analogy between the ſpreading

of waves, raiſed from a centre in water, ſuch as proceed from dropping a pebble. *etc.* and the expanſion of ſounds in the air, is obvious; only obſerving, that as the motion of a wave on the ſurface of water is that of a circle, regularly extending itſelf round the point where it was firſt produced; ſo the motion of ſound in the air is that of a globe expanding itſelf equally in all directions round the ſounding body, which is its centre: and that what the water does by means of its gravity and fluidity, the air does with much greater freedom by its ſpring or elaſticity.

9. But though the air can receive and tranſmit ſounds of all kinds at the ſame time, yet neither our muſical inſtruments are adapted to produce an indiſcriminate variety at once, nor our faculties capable of attending to, and reliſhing them, were they ſo produced. If a ſtring or pipe, when ſounded, produce a combination of tones offenſive to the ear, we ſay it ſounds falſe, or is miſtuned, and on that account reject it; therefore the real choice of the ear might be aſcertained, pretty ſatisfactorily, by examining carefully what are the properties of thoſe ſounds which we receive into our muſic: which enquiry Monſ. Rameau purſued with great ardour in his *Generation Harmonique*, printed at Paris, 1737, and other following works. But ſtill it may be objected, that this is only proving that the ear chuſes ſuch ſounds *becauſe it chuſes them*, and no philoſopher ought to reſt ſatisfied with this method of reaſoning. We want, if poſſible, to know why the ear chuſes and refuſes, as we find it does; and, for this purpoſe, ſome new principle muſt be adopted. The following one, which, to propoſe and ſupport, was one principal deſign of this part, ſeems to promiſe good ſucceſs in this enquiry.

10. The new principle we have here to propoſe, as being that whereby the various choices of a muſical ear are beſt accounted for, is that of our diſtributing the vibrations of muſical ſounds by *iſochronous*, or *equal-timed parcels*, ſomething very ſimilar to the diſtributions we find natural to be made among quavers, or other ſhort notes, in the timing of muſic.

11. To ſupport this principle we may obſerve, in various inſtances, where equal and equidiſtant objects affect our ſenſes, that there is a certain propenſity in our mind to be ſubdividing the larger numbers into ſmaller equal parcels; or, as it may be juſtly called, compounding the larger numbers of ſeveral ſmall factors, and conceiving the whole by means of its parts.

When we caſt our eyes on nine equidiſtant windows in a row, they are no ſooner ſeen than ſubdivided into three times three: eight appears at firſt ſight to be two fours, and each of theſe fours, two twos: ſeven we conceive as two threes disjoined, and one in the middle; ſix moſt naturally divides itſelf into two threes; but if ſeen along with nine, or immediately after it, we then triſect it, in conformity with nine, and it appears three twos: five becomes two twos diſjoined, and one in the middle; four is two twos, and ſingle three or two need no ſubdiviſion.

12. In the above caſe, the whole number preſent themſelves to our ſenſe at once; but in the timing of muſic, the notes occur in ſucceſſion, which occaſions ſome difference: for here we have to do not only with the choice of the mind, but alſo with the memory. The mind inſiſts that all our notes be made up, as it were, into iſochronous parcels, which we call bars, or meaſures, and that the number of equal ſhort notes which conſtitutes each meaſure, be a number ſomeway compounded of the ſmall factors two and three multiplied together, and rarely admits any larger factor than theſe.

13. Thus the firſt, or primary diviſion of the meaſure in common time, is into two parts, and the primary diviſion of the triple meaſure is into three parts; theſe may be again ſubdivided, either into two or three each, and theſe ſecondary diviſions again ſubdivided into two or three, and ſo on. The diviſion into four parts reſolves into two and two; and an e-

qual diviſion into five parts is not eaſily admitted * in timing of muſic, and much leſs ſeven. Theſe particulars are largely diſcuſſed in Part I. Chap. iv. of *Time.*

14. Beſides this diſtribution of muſic into meaſures, the mind extends its views, and as far as the memory can be ſuppoſed diſtinctly to retain, goes on to conſtitute ſome number of meaſures into iſochronous phraſes, or ſtrains of a tune; and theſe ſtrains may contain a greater number of meaſures in quick time than in ſlow time, becauſe of the inability of the memory; but here, as before, the number of meaſures in a ſtrain muſt always be either two or three, or ſome product of theſe numbers: for here five bars in one ſtrain is not uſed, and ſeven proves much more intolerable.

For an inſtance of this it may be obſerved, that in the ſlow tedious way of ſinging pſalms, which is in uſe among us, the memory has enough to do to retain the length of one ſingle bar; as the number of pſalm ſingers, who do not keep *true time*, plainly evidences: here we cannot conſtitute any larger portions or ſtrains, and one bar is all we regard at once; ſo that if the firſt line employ four bars, and the next line only three, we are not ſenſible of any impropriety: but let us try to ſing a pſalm tune, adapted to the common meaſure, where the lines are alternately 8 and 6 ſyllables, much quicker than uſual, and we ſhall find ourſelves under a neceſſity either of holding on the laſt notes of the ſecond and fourth lines, or of reſting at the ends of theſe lines, till the *time* of the firſt and third lines be elapſed: becauſe in this way of ſinging the memory retains the whole length of the line, and therefore we muſt make theſe lengths all equal, they muſt be iſochronous ſtrains.

Common minuets and marches generally conſiſt of ſtrains containing 4 bars each; and here we are ſenſible of no impropriety, although the firſt part of the tune ſhould contain only 12 or 16 bars; that is, 3 or 4 ſtrains, and the next ſucceeding part perhaps 20 or 24 bars; that is, 5 or 6 ſtrains; for we do not commonly advert to any greater portion than 4 bars at once.

Where the movement is much quicker, as in jigs, *&c.* we ſtill include a greater number of bars into one ſtrain; or, to ſpeak more properly, we make up two, three, or four ſtrains into one ſtill larger parcel, which we call one *part* of the tune: and here theſe parts, although containing 8, 9, 12, 16, or more bars each, are yet as cloſely reſtricted to be each of an equal length, or number of bars, as any ſingle bar is reſtricted to contain juſt the time of ſo many crotchets, becauſe the memory includes a whole part at one view.

15. Theſe, and numberleſs other familiar and obvious inſtances, which the reader will not fail to ſuggeſt to himſelf, on many occaſions, tend directly to the confirmation of our *new principle*, viz. that among the iſochronous ſingle vibrations of muſical ſounds, the mind naturally ſeeks to conſtitute *iſochronous compound parcels*. And if it ſhould be objected, that although experience plainly proves this to be the caſe with the ſhorteſt notes uſed in muſic, yet perhaps the vibrations of a ſound are much too quick for the mind to lay hold on; and that where the ſucceſſion of pulſes is much quicker than can be counted, or ſenſibly diſtinguiſhed one from another, as they paſs, which is the caſe with the pulſes of a ſound, we cannot conceive any preference due to one number above another, becauſe we ſee no poſſibility of aſcertaining the preciſe number.

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* The diviſion of a crotchet into five equal parts, though not uſed formerly, is introduced by ſome of the beſt compoſers of the preſent age. The works of the right honourable the Earl of Kelly contain ſeveral inſtances of it, denoted by five ſemiquavers, figured over with a 5—: neither does it ſeem to be any more difficult either to execute or to reliſh this kind of ſubdiviſion into 5, than what may juſtly be attributed to the want of that habitual familiarity which we have contracted with the other ſubdiviſions.

To remove this objection, which ſeems to be the moſt weighty one that can be caſt in our way, let it be obſerved, that it is one thing for the ſenſe to be pleaſed with a number, and another thing to count it; and that we may perceive the equality, or iſochroniſm, not only of certain compound parcels, but alſo of each ſingle pulſe, when a drummer beats much quicker than can be counted; and an inequality among the ſingle pulſes, or falſe and irregular time among the larger compounded parcels would diſguſt us as much in this caſe, nay more than if the ſucceſſion of pulſes were ſlower.

The caſe is much the ſame in objects which pleaſe the ſight. There is a certain ſymmetry which ſtrikes us immediately with delight, in the proſpect of a regular and well-deſigned piece of architecture; neither have we any occaſion to count and meaſure the proportions of the ſeveral parts, before we can enjoy the proſpect. The pleaſure ariſes inſtantaneouſly from the perception of certain due proportions, though it is a work of time and ſtudy to determine exactly what thoſe proportions are. This may ſerve to apologize for the uſe of numbers in the theory of muſic; becauſe, in all probability, the due proportions which exiſt among the vibrations of muſical ſounds, are the very things from whence our pleaſure is derived; and thoſe proportions are beſt examined by means of their conſtituent numbers.

16. The timing and parcelling of the beats of a drum is an inſtance which approaches neareſt to that of the vibrations of a ſound; and, I think, we need not deſire any thing nearer: for here the quick ſucceſſion renders it impoſſible to count the ſingle pulſes, all we can here do is to judge of, and I may ſay *feel* the iſochroniſm of each; and that this is what we can alſo do among the ſingle vibrations of ſounds is plain from Art. 3. becauſe we find a neceſſity of rejecting all ſuch ſounds as want this uniformity or iſochroniſm.

If a drummer were to give a number of quick, but equal-timed beats, each with juſt an equal force, a perſon attending to them would moſt naturally parcel them by 4 and 4 together, by giving a greater regard to every 4th beat; by which regard theſe beats would to him acquire a kind of emphaſis or accent, as if the drummer did really ſtrike them harder than the others, which indeed he could ſcarce avoid doing, becauſe his own imagination, as well as that of a hearer, would moſt readily lead him to this kind of parcelling. But the caſe would be the very ſame with a hearer, if an inanimate machine were made to beat the drum. The ſame circumſtance is alſo well exemplified in the timing of muſic. See Part I. Art. 94, 95.

Let it be obſerved, that we only ſay it is moſt eaſy and natural for us to parcel ſuch equal timed pulſes by 4 and 4 together, when there is no attendant circumſtance to influence our choice either one way or another: for it is very obvious, that we can with great eaſe imagine thoſe pulſes to proceed by 3 and 3 together; and this we ſhould certainly do, if we were to turn our attention from one ſett of pulſes, which we had firſt heard and mentally parcelled by 4 and 4, upon another ſett of pulſes, juſt ſo much ſlower as that three of the latter ſhould exactly take up the ſame time as four of the former; for here the deſire of continuing the ſame equal meaſure of time, would inevitably lead us to parcel the latter by 3 and 3. We can alſo, upon occaſion, go on further, and conſtitute iſochronous compound parcels, each conſiſting either of 4 or of 3 primitive parcels; but here again it is more natural for us to quadruple than to triple our primitive parcel; and if the ſucceſſion of pulſes be quick enough, we can proceed yet further, either by quadrupling or tripling the compound parcel.

17. The well known rules of time in muſic afford us ſtill more familiar inſtances, for confirmation of the ſame principle. Suppoſe a piece of muſic to begin in pretty quick common time, ſuch as gives us liberty to parcel the bars by 4 and 4 together, into iſochronous ſtrains, (Art. 14.). In this caſe, the time of one ſtrain will be mentally ſubdivided into 4 equal parts, or bars, and each of theſe into 2 or 4 equal parts, *viz.*

2 minims or 4 crotchets, and each crotchet into 2, or 4, or 8 equal parts, *viz.* 2 quavers, or 4 ſemiquavers, or 8 demiſemiquavers: ſo that here we have an eſtabliſhed meaſure of time divided into 4 ſemibreves, or 8 minims, or 16 crotchets, or 32 quavers, or 64 ſemiquavers, or 128 demiſemiquavers; and the ſame mental ſubdiviſion will ſtill take place, if the muſic proceed by any of theſe notes, any way combined and intermixed. Now, if the muſic, for the ſake of variety, begin afterwards to move by quavers, figured over with 3, *viz.* each being the exact third part of the crotchet, (ſee Part I. Art. 67.) which it very frequently does, this makes no alteration in the length of the crotchet, nor in the length of the whole ſtrain of 4 bars, but only in the ſubdiviſion; for now the whole ſtrain or meaſure of time muſt be mentally divided into 4 ſemibreves, or 8 minims, or 16 crotchets, as before; and theſe laſt ſubdivided into 48 quavers, or 96 ſemiquavers.

We ſee then, that in the timing of muſic, we often paſs from the diviſion of a ſtrain into 64 or 128 equal parts, to another kind of diviſion into 48 or 96 parts, and reſume again the original diviſion at pleaſure, and from thence derive a very agreeable variety.

18. Before we purſue theſe ſpeculations any farther, the reader will not be diſpleaſed to ſee a few uſeful inferences, relative to the properties of muſical ſounds in ſucceſſion, drawn from what is already paſt. If there be really an analogy between the diſtributions which we ſenſibly make among quavers, and other ſhort notes, in the timing of muſic, and thoſe which we inſenſibly make among the vibrations of muſical ſounds; and if the pleaſure which reſults from the hearing *well-tuned ſounds* owe its riſe to the ſame principle which influences us to be delighted with *well-timed notes;* then we may, by means of the known practice of dividing time in muſic, bring to light the hitherto unknown principle which guides us in the choice and arrangement of muſical ſounds.

CHAP. II. *Of* MUSICAL SOUNDS *in Succeſſion.*

Article 19. WHEN two ſounds differ from each other by the interval of an octave, it is well known that the acuter of them makes two vibrations for one of the graver; and when the interval is a double octave, their vibrations are 4 to 1; and when a triple octave, 8 to 1; and ſo on, continually doubling the vibrations of the acuter term, for every octave which is added to the interval: and that the effects of ſuch ſounds are to us ſo perfectly alike, that muſicians have univerſally agreed to call them all by the ſame name, and denote them by the ſame letter, and in all reſpects to conſider them as ſimilar ſounds. Now, in the timing of muſic, when a bar, or ſtrain, contains any certain number of crotchets, we can at pleaſure imagine each crotchet to contain two quavers, or 4 ſemiquavers, or 8 demiſemiquavers, without ſuppoſing any manner of change in the nature of the time; ſo that the very ſame bar which contains three crotchets, may, at pleaſure, be imagined 6 quavers, taken by 2 and 2; or 12 ſemiquavers, taken by 4 and 4; *etc.* without any change in the triple mood of time: and the very ſame bar which contains 9 crotchets, may be 18 quavers, taken by 2 and 2; or 36 ſemiquavers, taken by 4 and 4; without any change in the nonuple mood of time. Analogous to this, in the diſtribution of muſical vibrations into *iſochronous parcels*, whatever number of vibrations of one ſound be parcelled together, the vibrations of its octave above, taken by 2 and 2, and thoſe of its double octave above, taken by 4 and 4, or of its triple octave above, taken by 8 and 8, will each conſtitute a parcel the very ſame in all reſpects with the firſt. So that as the diviſion of a crotchet, or other ſhort note, into 2, or 4, or 8, makes no alteration in the nature of the time in muſic, ſo the doubling and redoubling the number of vibrations in a parcel, makes no alteration in the effect of ſuch parcel on our ſenſe: and this accounts in the moſt ſatisfactory manner for the well known ſimilarity of all octaves, each to other.

20. Purſuing the ſame analogy, the faculty of remembering the key note, and the conſtant expectation of returning to it at the concluſion, which is ſo remarkably perceived by the muſician (ſee Part I. Article 29.) reſolves immediately into that of retaining the idea of a ſmall portion of time, divided and ſubdivided in ſome *eligible* manner, by the vibrations of the ſame key, or its octaves; and agrees exactly with the remembrance of the length of one bar or ſtrain, and of the mood of time, in the timing of muſic.

21. To diſcuſs this matter more diſtinctly, we ſhall, in this treatiſe, give the name *module* to that ſmall portion of time, by which we ſuppoſe the vibrations not only of the key, but alſo of every other ſound which we admit into our muſic, while we retain that key, to be meaſured and diſtributed into iſochronous parcels.

22. It will eaſily be obſerved, that whatever ſmall portion of time be taken for a module, there may always be a certain pitch or tone of ſound, whoſe vibrations ſhall divide the ſame module in any aſſignable manner whatever. Thus, for an inſtance in ſmall numbers, as one ſound may divide the module into 16 equal parts; ſo another ſound, a little graver, ſhall divide the ſame module into 15; another ſtill graver, into 14; another into 13, and another into 12 parts; and ſo on downwards. Thus alſo, in aſcending above that ſound which divides the module into 16, there will be found another, a little acuter, which ſhall divide it into 17; another, ſtill acuter, which ſhall divide it into 18; another into 19; and another into 20; and ſo on upwards. But then it muſt be remarked, that thoſe ſounds only are of uſe in our muſic which divide the module in certain ſimple and intelligible manners, and ſuch we ſay have *eligible parcels.*

23. Thoſe ſounds are alſo moſt eaſily and naturally admitted, which aſſume the moſt ſimple parcels, *viz.* ſuch parcels as are compounded of the powers or products of the ſmalleſt numbers, 2 and 3. Other ſounds are admitted, but with more difficulty, and generally only as dependants, or *harmonics*, whoſe parcels involve the higher numbers 5 and 7; but thoſe whoſe parcels involve any of the higher prime, or uncompounded numbers, 11, 13, 17, *etc.* are totally rejected.

24. Now, ſuppoſing our ear to be entirely unbiaſſed, and not retaining the leaſt impreſſion of any former heard ſound, when a muſical ſound is firſt propoſed: in this caſe, we ſhall moſt naturally regard this firſt heard ſound as a principal key note of a ſharp ſeries, and ſhall mentally parcel its vibrations by continual reduplication, or by the powers of 2, rather than in any other practicable manner; and thus we ſhall conſtitute a module divided and ſubdivided by continual biſection, like the meaſure in common time.

Every ones own experience will ſufficiently teſtify, that when the firſt ſound of a tune is not the principal of a ſharp ſeries, but perhaps a fifth, or a third, or a ſecond, or a ſixth; in all ſuch caſes, there is a neceſſity of ſomething of a previous preparation of our mind, by *thinking over* a few of the firſt notes of our intended tune, in order that we may readily fall upon the proper manner of parcelling ſuch firſt ſound, as ſoon as ever it is propoſed; but when the firſt ſound is to be itſelf the principal of a ſharp ſeries, there is no need of any ſuch preparation.

The church-clerk, or precentor, who begins the pſalm-tune immediately after the ſounding of a pitch-pipe, will be abundantly ſenſible of this: for if the intended tune be one of a flat ſeries, which has the ſixth of the natural ſcale for its key; or if it be one of a ſharp ſeries, and yet the firſt note be not the principal key; he will, in either of theſe caſes, find that it requires ſome care and attention to begin his tune right: whereas, if the firſt note be the key note of a ſharp ſeries, he cannot eaſily go wrong. When the tune is uſhered in by an organ prelude, or any other ſymphony, theſe difficulties are entirely evaded by the impreſſions of the preceding notes.

Granting that it be natural and neceſſary for the purpoſes of muſic, to diſtribute the vibrations of ſounds into certain parcels, there is no doubt but we ſhall moſt naturally parcel the vibrations of the firſt ſound we hear in the moſt eaſy and ſimple manner; for it muſt certainly be the prejudice of an already conceived module, which puts us upon the more difficult and complex ways of parcelling, in order to make certain following ſounds commenſurate with thoſe which have already preceded them.

25. It is a curious and intereſting ſpeculation, to attempt to determine the real number of vibrations which we ſhall include in one module, when a ſound of a determinate pitch is conſtituted a key; and this may be done pretty well, by obſerving, that the whole compaſs of audible ſound is limited, tho' its limits are ſomething different, according to the different perfection of the organs of hearing. One perſon's ear can eſtimate an acuter ſound than another's, much like as one perſon's eye can diſcover a minuter object than another's. The whole compaſs of muſical ſounds which the ear can eſtimate without any help of art, is generally found to be more than ſix, but leſs than ſeven ſucceſſive octaves. Suppoſe it to be ſeven octaves complete; as from F, a double octave below the baſs cliff line, to F, a triple octave above the uppermoſt line of the treble ſtaff, at concert pitch. The higheſt of theſe F's will then make 128 vibrations, (*viz.* the 7th power of 2) while the loweſt makes 1 vibration. Now it is reaſonable to imagine, that the vibrations of this higheſt F are as quick as the ſmalleſt mental ſubdiviſions which we can make in a given module, which may be the cauſe why no ſound ſtill acuter can be admitted into our muſic. And on the other hand, it is equally reaſonable to imagine that no ſound can be eſtimated till three, at leaſt, of its pulſes have been felt, becauſe three pulſes only determine two of the ſmall intervening particles of time; and till we have perceived two or more of theſe particles, we can form no judgment concerning their equality; that is, we cannot eſtimate the tone of the ſound. Therefore, as in attempting to eſtimate a very grave tone, we undoubtedly take our module as long as poſſible; ſo it is probable that the longeſt module we can take will not contain more than 3 vibrations of this loweſt F.

The concluſions deduced from theſe two premiſes are, 1. That the longeſt module we can take may poſſibly contain 3 x 128, or 384 ſmall ſubdiviſions, either real or imaginary, but cannot contain more. 2. That the longeſt module we can take may poſſibly contain 6 vibrations of the double F, which ſtands next below the baſs ſtaff; or 12 vibrations of the F which ſtands on the baſs cliff line; or 24 vibrations of the F which ſtands next below the treble cliff line; or 48 vibrations of the F which ſtands on the uppermoſt line of the treble ſtaff, *etc.* continually doubling the number for every upper octave.

26. If the above particulars be granted, it will follow, that when the F below the treble cliff line, is heard, and conſtituted a key, our module may include juſt 16 of its vibrations

(for it cannot be ſo long as to include 32.;) and theſe 16 we mentally divide and ſubdivide like the crotchet in briſk common time, Art. 17.: but it muſt be obſerved, that the expert muſician is able both to conſtitute a longer module, and to deſcend to more minute ſubdiviſions than the beginner; which we find is exactly the caſe in the timing of muſic: ſo that where the expert muſician conſtitutes a module including 16 vibrations, and mentally ſubdivides each ſingle vibration into 8 or 16 parts, the beginner will perhaps include only 4 vibrations, or 8 at moſt, in his module, and will only mentally ſubdivide each ſingle vibration into 2, or 4 at moſt. But if theſe particulars ſhould be found to want ſomething of the undeniable evidence which a philoſopher deſires, it is of little importance, as to what follows; becauſe all the inference we ſhall here draw from them is, that whatever number of real vibrations be contained in a module, an expert muſician can proceed by mental ſubdiviſions, as far as the 256th part of the whole module; and this will readily follow from the conſideration of the ſubdiviſions of the ſtrain of muſic, Art. 17th, by obſerving, that as the vibrations of muſical ſounds are vaſtly quicker than the ſhorteſt notes of muſic, ſo we have it in our power to parcel together a ſtill greater number of them, or their parts, in one module.

27. After the key note, the firſt and moſt natural change of ſound is into the fifth of the ſcale, for the riſing or falling an octave makes no change. Now, the fifth makes 3 vibrations for every 2 of the key note below it, and conſequently 3 for every 4 of the key note above it; and this correſponds exactly with the change from 2 quavers or 4 ſemiquavers in a crotchet, to 3 equal quavers, figured over with a 3, taken notice of, Art. 17th, with this difference only, that there the change from the half to the third part takes place only in the ſmaller ſubdiviſions, *viz.* the 16th part of the whole ſtrain, being beſt admitted in ſhort notes; whereas, in turning our attention from the key to the fifth, it is moſt probable that the change takes place in the primary diviſion of the module; ſo that as the key preſents a module divided into 2, and theſe ſubdivided by the powers of 2, ſo the fifth preſents the ſame module divided into 3, and theſe ſubdivided by the powers of 2. This circumſtance alone might be ſufficient to preſerve our new principle from being rejected without further tryal; and, joined with the other particulars already ſpoken of, will ſufficiently apologize for our endeavouring to purſue the analogy a little further, before we truſt its fate to the critical world.

28. In order to make out the whole ſcale of muſic, it is neceſſary to ſuppoſe that the ſubdiviſion into 5 equal parts is alſo eaſily admitted, though not quite ſo natural as the ſubdiviſion into 2 or 3; and this will readily be granted ſince this kind of ſubdiviſion is now taking place in our muſic; ſee the note to Art. 13th. We muſt alſo go yet further, and allow the ſubdiviſion into ſeven equal parts, on ſome occaſions, to be practicable; of which I believe we have as yet no precedent in the timing of muſic; and this gives occaſion for ſome farther enquiry, whether this kind of ſubdiviſion might not alſo be introduced there without offence.

29. It is evident, that when we ſee 5 or 7 windows in one row, (Art. 11.) there is nothing too complicated in the idea, but that we readily conceive 5 by its affinity to 4, and 7 by its affinity to 6. This remark will be of farther uſe. There is a perceivably greater difficulty in reconciling the number 11, which is the next *prime*, or undividable number, greater than 7; ſo that, at the firſt ſight, 11 appears as a kind of irregular confuſed *multitude*, too large to be conceived without ſome ſubdiviſion, and yet not capable of any regular diſtribution into equal ſmaller parts. This may poſſibly have partly been the occaſion of the firſt arithmeticians ſtopping at the number ten, and repreſenting the next number eleven, by conjoining ten and one together, becauſe they found it almoſt impoſſible clear-

ly to conceive the number 11, all at once, while the other ſmaller numbers were abundantly ſimple and eaſy to be underſtood.

30. This leads us to take notice of a very remarkable difference between the arithmeticians and the muſicians methods of conceiving the larger numbers. In the uſual method of expreſſing numbers by units, tens, and hundreds, *etc.* their very names import a mixed idea of ſeveral diſtinct parts concurring together in one total ſum; and as we conceive an hundred by its being ten times ten; ſo when a number is expreſſed in hundreds, tens, and units, we conceive it in three parts, the firſt containing ſo many hundreds, the next ſo many tens, and the laſt ſo many units; and theſe three we join together, in order to get the idea of the total number, without any regard to the factors by which ſuch number may be compoſed, except it be juſt one of the powers of ten, *viz.* an hundred or a thouſand, *etc.* In the notation of numbers we regard no other products but ſuch as have the number ten, or ſome of its powers, for one factor, and one of the ſingle digits for the other; and all numbers which conſiſt of more than one ſignificant digit, are conceived by *piece meals.* But in muſic theſe *piece-meal conceptions* have nothing to do: here all large numbers muſt be received as compounded of ſmall and intelligible factors, or elſe rejected. Thus the number 64 takes place as it is compounded of the ſmall factor 2; and 27 is received as compounded of 3, without any regard to the tens and units which they contain. Thus alſo 15 is received as being 3 times 5; and 21, as being 3 times 7; and ſo of the reſt.

31. Now, though it is impoſſible to foretel whether ever the ſubdiviſion into ſeven equal parts will be introduced in the time of muſic; yet it is eaſy to perceive, that ſuch a ſubdiviſion would be beſt admitted in very ſhort notes: and that as 5 equal ſhort notes are introduced, where we naturally expected 4; ſo 7 might probably be introduced where we naturally expected 6: ſo that after hearing one crotchet broke into ſix equal ſemiquavers, figured over with 6, the next crotchet might be broke into 7, upon occaſion; and though this ſubdiviſion ſhould be for ever rejected in the timing of muſic, yet it may ſafely be ſuppoſed to take place in the parcelling of muſical vibrations, on account of the very quick ſucceſſion of the latter, which gives us a greater latitude in that reſpect.

32. We ſhall now take a view of the iſochronous parcels of each degree of the natural ſcale of muſic, which, in their ſmalleſt numbers are,

key	32
ſeventh,	30
acute ſixth,	27
fifth,	24
grave fourth,	21
fundamental great third,	20
ſecond,	18
key,	16

Theſe numbers are ſuited to the deſcending ſcale, in which the grave fourth takes place, as obſerved, Part I. Art. 33, *etc.*

33. We have already ſeen, Art. 27th, that after the key note, the moſt natural change of ſound is into the fifth; but when we propoſe to deſcend by the ſmalleſt practicable degrees, in order to make a complete ſcale, we take the ſeventh inſtead of the fifth; that is, we take 30 vibrations inſtead of 24: and this preſents a module divided, like the fifth, into 3; but each of theſe ſubdivided into 5, inſtead of 4; or 10; inſtead of 8. And thus, as we conceive of 5, by its affinity to 4, Art. 31. ſo, while we ſound the ſeventh of the ſcale, the fifth is eſſentially implied, and is our fundamental.

34. The interval between two ſounds, whereof the acuter makes 5 vibrations for 4 of the graver, is uſually called a greater third. We ſhall here give it an additional epithet, and call it a fundamental great third: becauſe, for the reaſons given above, the lower term of ſuch an interval will always be eſteemed the fundamental; and becauſe there are other great

thirds, not in the ſame proportion, whoſe lower terms are not the fundamentals.

35. The next note which we take in deſcending, after the ſeventh, is the acute ſixth, which has 27 vibrations, or parts, in the module; and this we are obliged to refer to the ſecond as a fundamental, which has 18 vibrations in the ſame time, and to which it becomes a fifth. To account for this, it muſt be obſerved, that after the module has been heard divided ſimply into 3 parts, we may, at the next ſtep, proceed to triſect each of its third parts; and, by this means, introduce a diviſion into 9, which correſponds with the ſecond of the ſcale: but we cannot eaſily reconcile the making of two ſuch triſections at one ſtep; that is, we can ſubſtitute 3 vibrations inſtead of 4; and contrariwiſe, 4 vibrations inſtead of 3: but we cannot immediately ſubſtitute 9 vibrations inſtead of 8, nor 8 inſtead of 9; which is exactly the caſe in the timing of muſic alſo. Now, the acute ſixth has 9 vibrations for 8 of the fifth, which was the laſt object of our attention: therefore, though we take this note, we are obliged to regard it only as one of the harmonics of the ſecond, which has 3 vibrations for 4 of the fifth; and which, on that account, becomes our fundamental: ſo that here we have the module divided into 9; and though each of theſe is really again ſubdivided into 3, yet by refering to another fundamental, which has the ſame ninth parts ſubdivided only into 2, we reconcile this diviſion with the ſimple triſection which preceded, and which muſt alſo follow in the next note.

36. The next note is the fifth itſelf, which we naturally take as a fundamental, and thereby reſtore the ſimple triſection of the module. The ſame fifth, in other ſucceſſions, is often refered to the key as a fundamental; but this we cannot here do, becauſe it would require the paſſing from a module divided into 9, to one ſimply biſected, which we have already ſeen is unnatural.

37. Next follows the grave fourth, which divides the module into 21 parts, *viz.* into 3, and each of theſe into 7. Now, according to the analogy formerly laid down, theſe 7 parts ſhould be admitted inſtead of 6; and conſequently the grave fourth, which is 21, neceſſarily implies the ſecond, which is 18, to which it ſtands as a leſs third; and this would have been our fundamental, if the ſucceſſion would have admitted it; but perceiving that the third of the ſcale is next to follow, which having 5 vibrations for 4 of the key, will inevitably require the key for its fundamental, Art. 34. and that if we here take the ſecond as fundamental, we cannot take the K*f* immediately after it: we therefore refer the grave fourth, and its implied ſecond, to the fifth fundamental which exiſted in the preceding note, and to which the fourth becomes an added 7th, as the ſecond is its 5th.

38. The third, which next follows, takes the K*f*, and the ſecond neceſſarily takes the 5*f*, as is obvious from the preceding conſiderations: and this arrangement of fundamentals to the deſcending ſcale is exactly agreeable to the practice. See Part I. Art. 216. and Exam. XLII.

39. Inſtead of taking up our time in examining any other particular paſſages of melody, we may obſerve from the above, that it is not in the ſucceſſions of notes themſelves, but in the fundamental progreſſions, that the analogy exiſts between the diviſions of the time in muſic, and the diviſions of the module: and ſo it ought to be, as we have largely ſhewn in the firſt part of this treatiſe that the fundamental progreſſion is the baſis both of harmony and melody, and that every ſinger conforms his ſounds to certain fundamental progreſſions, only diverſifying the ſtrain, and rendering it more melodious, by the occaſional uſe of the harmonics, inſtead of the fundamentals themſelves. We may alſo obſerve, in the deſcending ſcale, that the ſounds which include the number 5 in the compoſition of their parcels naturally become great thirds, and

the ſound, which includes the number 7, will be either a leſs third, or an added ſeventh; while the real fundamentals themſelves include only the numbers 2 and 3 in the compoſition of their parcels: ſo that the introduction of the more complex ſubdiviſions of the module in muſic may be attributed to the liberty of taking certain more difficult ſounds, as harmonics to a more eaſy fundamental *.

40. It will therefore be ſufficient, in this place, to obſerve, that the preference due to fundamental cadences is a neceſſary conſequence of this new principle; for the regular cadence, in the fundamental baſs, always implies a change from triſection to biſection, either of the whole module, or of ſome determinate part of it; and that, on the contrary, the irregular cadence implies a change from biſection to triſection: and that to determine upon what degrees of the ſcale theſe cadences may fall, it is neceſſary to examine what degrees can be formed by triſections only, and how oft this may be repeated; for all thoſe ſounds, whoſe parcels can admit of another triſection, have their perfect fifths exiſting in the ſcale, and therefore may be made fundamentals: but that note, where we can triſect no farther, cannot have its perfect fifth, and therefore cannot be a fundamental.

41. Now, from the principles already laid down, it will follow, that the higheſt power of 3, which we can admit in the parcelling of muſical vibrations, is its fifth power 243, ſee Art. 24, 25, and 26.; for the ſixth power, which is 729, is unqueſtionably beyond our limits. The ſounds repreſenting each of the powers of 3 are eaſily found, by proceeding from the key by ſucceſſive fifths aſcending, or fourths deſcending; thus, the key itſelf repreſents a continual biſection, or a diviſion by the powers of 2. The fifth of the ſcale repreſents a ſingle triſection. The ſecond repreſents a compound triſection or diviſion into 9: and the ſixth repreſents a diviſion into 27. Thus far we agree with the numbers in the ſcale, Art. 32; but we muſt go yet further, and ſuppoſe the third of the ſcale to repreſent a diviſion into 81; and the ſeventh of the ſcale a diviſion into 243. This third and ſeventh differ a little from thoſe in the ſcale, as will be diſcovered by comparing their numbers together: and in order to do this, we may freely double and redouble the ſmaller numbers, to bring them nearer to the larger; this being only the taking of the ſame ſound ſome octaves higher, or rather only enumerating the ſmaller ſubdiviſions of the module, which exiſt in the ſame ſound. See Art. 26. Thus the fundamental great third of the ſcale, which, in Art. 32. is expreſſed by 20, may alſo be expreſſed by 40 or 80; and the third which ariſes from continual triſection, as above, is expreſſed by 81: ſo that this latter is acuter than the former, in the proportion of 81 to 80, which ſmall difference is called a *comma*. After the ſame manner the ſeventh of the ſcale, which, in Art. 32. is expreſſed by 30, may be redoubled to 240; and the ſeventh which is produced by continual triſection, as above, is 243; being alſo acuter than the former in the ſame proportion of 243 to 240, or 81 to 80, which is a *comma*.

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* That ſome ſounds are more difficult to be taken than others, will not be denied by any who has tried to ſing at all: and this difference is entirely owing to the different degrees of ſimplicity in the ſubdiviſion of the module; for if a ſinger do not perceive and reliſh the proper ſubdiviſion of the module, he cannot ſound the note with any ſatisfaction. Thus although the deſcending ſcale, as deſcribed above, is perfectly eaſy and natural to a proficient, there are many beginners who cannot give the grave fourth its proper ſound; and ſome who cannot reliſh either the ſeventh, or the third of the ſcale, for want of being habituated with the ſubdiviſions into 5 or 7, which theſe ſounds imply. And the beſt way to help a beginner over theſe difficulties is to let them frequently hear the proper fundamentals ſubjoined, by way of a baſs.

42. The inferences we ſhall, in this place, draw from the preceding obſervations, are,

(1.) The key, the 5th, the 2d, and the 6th of the ſcale are the eaſieſt and moſt natural ſounds; and in the tone of theſe, as they occur in the deſcending ſcale, all who have any taſte for muſic perfectly agree. But there are ſome, not deſtitute of a natural turn for muſic, but unimproved by acquaintance with the modern ſtyle of harmony, who, not conceiving any thing of the agreement of a great third; that is, not being accuſtomed to conceive 5 by its affinity to 4, admit no ſuch proportion among the ſounds of their ſcale; but make their third a comma too acute, and alſo their ſeventh; which laſt they admit but rarely, on account of its parcel being rather too complicated for them; and ſuch ſingers have no fourth at all. This is the true origin of the genuine old Scots tunes, ſuch as have undergone no changes by the interpolations of foreigners: and it is not eaſy to join a moving baſs to one of this ſort, becauſe every note muſt either be a fundamental, or a fifth, and this affords not ſufficient variety to entertain a modern ear: and the joining of a ſecond treble to a tune of this ſort is ſtill more impracticable, becauſe the fundamental great third cannot take place at all.

(2) Though the modern ſinger can, on occaſion, take his third in the relation of 5 to 4, *viz.* a fundamental great third to the key; and his ſeventh in the ſame relation to the fifth; and though he generally does ſo, in order to confine his fundamental progreſſion more cloſely to the original key, and the ſounds which are neareſt related to it; yet he can alſo, with the greateſt eaſe, take his third as a perfect fifth above the 6th *f*; and, in this caſe, it will be a comma more acute than ordinary: and he can take his ſeventh a perfect fifth above this acute third, as a fundamental; which will alſo render it a comma more acute than ordinary. For in theſe he does no more than what nature ſuggeſts to the moſt uncultivated ſinger.— By this means we ſee how the ſixth and third of the ſcale may alſo take place in a fundamental baſs, and that the ſeventh of the ſcale cannot be admitted there.

(3.) Theſe different ways of conceiving the third and ſeventh of the ſcale may effectually take place, although no alteration be made in the real pitch of the ſounds. When the difference of two ſounds is only a comma, we readily take one inſtead of the other, in a ſucceſſion of ſingle ſounds, or melody: which may be accounted for by obſerving, that in caſe our imagination ſhould lead us to conſtitute a parcel of 81, by repeated triplication, though, at the ſame time, 80 vibrations of the ſound which ſtrikes our ear, would fill up the whole time of our module, yet we may vary as much in the length of our module, as to include 81, without perceiving any inequality; juſt in the ſame manner as in the timing of muſic, one bar may be, and always will be ſome very ſmall matter longer than another, perhaps much more than one eightieth part of the whole bar, and yet we are ſenſible of no impropriety, if each bar be properly divided.— The mind allows not the leaſt deviation from the proper method of dividing and ſubdividing each parcel; but the equality of the whole ſucceſſive parcels, being determined by the ſenſe, is not ſo perfectly eſtimated. Hence it is that ſounds not exactly but nearly in the proportions of the ſcale are freely admitted into our muſic, and produce the ſame effects as if they were perfectly proportioned, becauſe we adapt our module to them without any *ſenſible* inequality: and hence the expert muſician becomes more critical in regard to the tune of ſounds than the beginner, becauſe he is more critical in regard to the equality of the time of ſucceſſive modules. Hence alſo the ſinger who, in the courſe of his performance, loſes or gains ſomething in the real pitch of his key note, is like a muſician who plays ſomething ſlower or quicker time towards the concluſion, than at the beginning of a movement.

43. It remains yet to be ſhewn, how the perfect fourth of the ſcale is introduced into our melody, of which we have hitherto ſeen no inſtance, and which nevertheleſs takes place in our modern muſic almoſt as eaſily, though not ſo frequently as the fifth. In order to this it is moſt natural to ſuppoſe, that after a very little acquaintance with the modern ſtile of muſic, we can occaſionally diſtribute the vibrations of the key into 3 parcels, each containing 8, or 16, or 32 ſmaller parts; which three parcels together conſtitute a module, ſimply triſected, like the bar in triple time, or like as we ſuppoſed the fifth of the ſcale to be parcelled, in the foregoing articles. And it will readily be granted, that as triple time, after a very little practice, becomes as eligible and as eaſy as common time, ſo may alſo this method of parcelling the vibrations of the key become as eligible as that formerly deſcribed: and in this way the module will contain 24, or 48, or 96 vibrations or parts of the key note.

44. See now the iſochronous parcels of each degree of the aſcending and deſcending ſcale of muſic, according to this way of conceiving the key.

Aſcending Scale	key,	96	Deſcending Scale.	key,	96
	ſeventh,	90		ſeventh,	90
	acute ſixth,	81		acute ſixth,	81
	fifth,	72		fifth,	72
	perfect fourth,	64		grave fourth,	63
	fund. great third,	60		fund. great third,	60
	ſecond,	54		ſecond,	54
	key,	48		key,	48

The intervals of this deſcending ſcale agree exactly with thoſe of Art. 32. for the numbers here are each juſt triple of the other; and the only difference between this aſcending and deſcending ſcale is in the fourth, which is 64 in aſcending, and only 63 in deſcending: that is, the perfect fourth is acuter than the grave fourth in the proportion of 64 to 63: which ſmall interval, not having formerly been ſuppoſed to exiſt among muſical ſounds, has no eſtabliſhed name; we ſhall therefore call it a *bearing;* not chuſing to borrow from any other language the name of an interval which a Briton firſt introduces.

45. In every paſſage of muſic our attention is partly divided, either between the key and its adjunct fifth, or between the key and its adjunct fourth, as fundamentals. Now, when the 5th takes place along with the key, we take the method firſt deſcribed of parcelling the key by continual reduplication, like the meaſure in common time; but when the fourth attracts a part of our regard, we aſſume a module of a different length, comprehending either three halves or three fourths of the other module, and which contains 24, or 48, or 96 parts, as in the laſt article: and by conceiving the principal key occaſionally in one or the other of theſe ways, the whole ſyſtem of modulation may be eaſily and ſatisfactorily aſcertained; of which we ſhall ſhortly take a minute view.

46. The moſt material objections which may here be made to this theory, ſeem to be ſuch as theſe.

Object. 1. Though it muſt be acknowleged, that if the mental diſtributions of the pulſes of muſical ſounds into iſochronous parcels be granted, as above deſcribed, the ſimilarity of octaves, the remembrance and expectation of the key, the origin of the whole natural ſcale, the dependence of the more difficult ſounds on other more eaſy fundamentals, and the preference due to the paſſages called fundamental cadences are well accounted for; yet what need is there of entering into abſtruſe ſpeculations about the diviſions and ſubdiviſions of an imperceptibly ſmall portion of time called a *module?* which, though they may take place, yet we never can be aſſured of it; nor can we ſupport the hypotheſis otherwiſe than by its analogy with the choice of the mind in other caſes, which ſeem to bear a reſemblance to it. When the moſt part of thoſe concluſions may be drawn from circumſtances which are obvious to every one, and of which the ear is a ſufficient judge.

Now to enter into an impartial examination of the ſufficiency of the principles formerly adopted, would require us to explain thoſe principles more fully than is conſiſtent with our preſent deſign; we ſhall therefore, in anſwer to the above, content ourſelves with making a few remarks, addreſſed to ſuch readers as are acquainted with, and prejudiced in favour of the theories formerly given.

(1.) The perfect ſimilarity of all octaves has never before been ſatisfactorily accounted for. If the perfection of the concord between two ſounds be taken as the reaſon of their ſimilarity, then the ſingle octave above or below any ſound, will have the greateſt degree of reſemblance, as it really has; but then the twelfth above or below, being a more perfect concord than the double octave, ought to have the next degree; and the greater ſeventeenth ought to be more ſimilar than the triple octave. Now the greater ſeventeenth, *v. g.* the greater third, below the key, is a ſound which does not enter into our ſcale at all, and the greater ſeventeenth, or greater third, above the key, has no ſort of reſemblance to the key: beſides, from this way of reaſoning, it would follow, that no two ſounds are perfectly ſimilar, except they be uniſons. No other property of ſounds has been examined into, in order to account for this moſt obvious circumſtance of the ſimiliarty of all octaves; but the fact has been taken for granted, as eſtabliſhed by experience, and the univerſal conſent of muſicians.

(2.) In regard to the origin of the ſeven ſounds, which conſtitute our natural ſcale of muſic, theſe have been deduced from the perfect chords of the key, and of its adjunct 5th, and 4th, as fundamentals; and the preference due to theſe chords has been attributed to their near relation to the key; one being a perfect fifth above, and the other a perfect fifth below the key. Thus the K, 3d, and 5th belong to the chord of the K *f*; the 5th, 7th, and 2d belong to the chord of the 5th *f*; and the 4th, 6th, and K belong to the 4th *f*. So that all the ſeven ſounds are ſuppoſed to exiſt in theſe three perfect chords: but then, what becomes of this ſuppoſition, when it appears that the fourth itſelf is frequently a deficient, or *grave fourth*, and therefore more than a perfect fifth below the key; and that the ſixth is ſtill more frequently an *acute ſixth*, and therefore more than a great third above the perfect fourth?

If, in order to aſſign a more ſatisfactory origin to the real ſounds of the aſcending and deſcending ſcale, we purſue the enquiry into the proper fundamental progreſſions, the added diſſonances, *etc.* as in Chap. VI. VII. and VIII. of Part I. we may at laſt obtain the true fundamentals of theſe ſounds, as in Art. 216. but then the queſtions why ſuch particular notes enter into each chord, and why ſuch and ſuch cadences are admitted, remain ſtill to be decided by the Theoriſt. See Art. 201.

(3.) If we endeavour to account for the preference due to cadences above all other paſſages in the fundamental baſs, by the near relation of any note to its fifth above or below, we are ſo far in the right; but then what is the cauſe of this near relation? and how ſhall we determine the affinity of ſounds which may properly ſucceed each other in a fundamental baſs? If the degree of perfection of the concord between two ſounds be aſſigned as the cauſe, then it will follow, that the leap of a great third, which is the beſt concord, except the octave and 5th, ought to be the moſt eligible fundamental paſſage, except the cadences, which is quite contrary to experience; for the leap of a great third is ſeldom admitted, while leaps of leſs thirds, and ſteps of ſeconds are very common.

(4.) Not to dwell longer on the inſufficiency of principles formerly received, than what ſeems abſolutely neceſſary in defence of our new principle againſt one ſort of readers, it ſhall ſuffice at preſent to aſk, whether it be more incredible to ſuppoſe, that the mind meaſures the proportions of ſounds by diſtributing them into iſochronous parcels, and perceiving the formation of ſuch parcels, as deſcribed above; or to ſuppoſe that thoſe proportions are perceived without any ſuch mental diſtribution, by ſome other unknown way? It being a well known fact, that in the caſe of imperfect uniſons, the ear perceives a better agreement when the real coincidences happen ſeldomer; and it is therefore more than probable, that the real coincidence of the vibrations is not a neceſſary circumſtance even in ſuch *concords* as the ear approves; much leſs in ſuch ſounds as are heard in ſucceſſion only, and compared with other ſounds which have no exiſtence but in the imagination, as fundamentals. Since then it is not by perceiving the coincidence of vibrations that we get the idea of theſe intervals, can any other way be thought of more ſimple than ours, and more analogous to the known choice of the mind in other like inſtances: and if the principle which we have adopted be as ſimple as any other, the concluſions reſulting from it are much more ſo. Nothing can be imagined more familiar than to repreſent the ſcale of muſic by a like ſcale of natural numbers; and to aſcertain the properties of each ſound by thoſe of its correſpondent number.

47. *Object.* 2. If this method of conceiving the vibrations of ſounds as meaſured by an eſtabliſhed module do really take place, one would imagine, that the proportion between the real time of that module, and the time of one of the ſhorteſt notes of the muſic ſhould alſo be perceived; and that this would in ſome manner regulate the real time of the muſic: for, as the pitch of the key note determines the length of the module, ſo the length of the module ſhould alſo be exactly ſome proper part of the length of the ſhort note. Thus, for inſtance, one would imagine that the ſemiquaver containing 2, or 3, or 4, or 6, or 8, or 9 modules, ought to be moſt natural; the ſame note, containing 5 or 7 modules, ought to be leſs natural, and containing any other number, not admitted in the parcelling of muſical vibrations, ought to be quite intolerable: and if this were the caſe we ſhould have a determinate number of moods, or degrees of quickneſs of time, belonging to any given key-note, in which all muſicians would agree as perfectly as they do in the degrees of ſound, which conſtitute the natural ſcale of a given key. But we find, by experience, that we are under no ſuch reſtrictions in the timing of muſic, and therefore ſuſpect the authenticity of a principle, which muſt be ſuppoſed to be ſtrictly regarded in the parcelling of the ſingle vibrations in a module, and diſregarded in the compariſon of the module with one of the ſhort notes, and again ſtrictly regarded in the parcelling of the ſhort notes into bars and ſtrains.

In anſwer to this objection, we obſerve the following particulars.

(1.) That it is ſuppoſed to be enough for the mind to perceive the diviſions and ſubdiviſions of any ſingle module, without going on to compound ſeveral modules together, in order to make up the time of a ſhort note in muſic; and that we are as little concerned about the number of modules in one note, as we are about the number of 4 bar ſtrains in one part of a march or minuet, Art. 14. Neither does it make any material difference though a ſmall portion of unmeaſured time ſhould intervene between the laſt module in one note, and the firſt in the following note, this being like an unmeaſured pauſe at a double bar, ſee Part I. Art. 109. and this accounts ſufficiently for the liberty we take in making the time of a note of muſic any length we pleaſe, provided it be proved that the ſhorteſt note which enters into our melody will contain more than one module.

(2) In regard to the real length of one module we may obſerve, that if the longeſt module we can take include 12 vibrations or pulſes of the note F on the baſs cliff line, at concert pitch, ſee Art. 25. the ſame note F is found to make about 320 pulſes in a ſecond [Mr. Emerſon, in his Fluxions, Sect. III. Prop. II. determines the note E, a ſemitone below, to make 300,] it will follow, that the quotient of 320 divided by 12, *viz.* 26 and two thirds, will be the number of modules in a ſecond, when they are the longeſt poſſible. And if, as we have afterwards ſuppoſed, Art. 26. the ſame note F be conſtituted a key, and 8 of its pulſes included in the module, we ſhall then have 40 modules in a ſecond. Now, the ſhorteſt note which enters into our melody, even in a ſhake, can ſcarce be leſs than the ſixteenth part of a ſecond, and will therefore contain more than two of theſe modules.

(3.) Mr. Emerſon in the inveſtigation and experiment here refered to, reckons the complete vibration to be the time in which a ſounding ſtring moves from one ſide to the other, like as we alſo reckon the vibration of a pendulum: but Dr. Smith, in his Harmonics, reckons the complete vibration to be the double of this, *viz.* the time in which a ſtring moves forward and back again; and in Prop. XXIV. determines the note D, in the middle of the open diapaſon of the organ at Trinity-College, which is the note below the treble ſtaff, to make 262 ſuch vibrations in a ſecond: and upon this he builds his directions for tuning a tempered ſyſtem of ſounds. Now, this D, being about the Roman concert pitch, and more than a ſemitone below the preſent opera pitch (Harmonics, Prop XX. Schol. 1. and Appendix to the ſecond edition, p. 271.) will be more than a great third below the lower F of the treble ſtaff, at the opera pitch: and the baſs D an octave below, which has 131 vibrations in a ſecond, will be more than a great third below the F, which is on the baſs cliff line. Suppoſe it exactly a great third, then ſay, as 4 : 5 : : 131 : 163.75, the complete vibrations of F in this caſe: which is a little more than the half of the above number, reſulting from Mr. Emerſon's experiment; owing, very probably, to this cauſe, that the virginal with which Mr. Emerſon made the experiment has not been tuned quite ſo high as the preſent opera pitch.

(4.) Granting, according to Dr. Smith, that the ear perceives only one vibration during both the courſe and recourſe of a ſounding ſtring; it will ſtill follow, that the ſhorteſt note which enters into our melody will contain more than one module, which is all we want to prove.

(5.) Though we can take the liberty of making the time of a note any length we pleaſe, yet ſtill there is a preference due to certain degrees of quickneſs, when the key note is aſcertained, and to certain keys, when the degree of quickneſs is aſcertained, of which the moſt experienced muſicians are abundantly ſenſible; and which perhaps will never be accounted for, otherwiſe than by a critical enquiry into the real length of the module of every key, and its proportion to the time of a ſhort note. But this we leave to ſuch as have more leiſure, and more experience in the practice.

CHAP. III. *Of* HARMONICAL ARITHMETIC.

Article 48. BEFORE we proceed to examine the nature and effect of combined ſounds or chords, it is neceſſary to lay down a few rules for the management of numbers, in computations relative to muſical intervals; or a ſmall ſketch of *Harmonical Arithmetic*. This will neither be long nor intricate with us; becauſe, in the way which our new principle leads us to conceive and expreſs the ſounds of muſic, we have little to do with the conſideration of arithmetical, or geometrical, or even harmonical proportion; and ſtill leſs with the properties of geometrical magnitudes, which have been needleſsly introduced in almoſt all the theories of muſic extant, to the great perplexity, but ſmall improvement of the readers.

49. The ſize or magnitude of a muſical interval is eſtimated by the inequality of the iſochronous parcels of vibrations of its two terms. Thus when there is no inequality in the iſochronous parcels of two or more ſounds, thoſe ſounds include no interval, and are called *uniſons:* and in proportion as their iſochronous parcels differ more from equality, the included interval becomes greater.

This proportion of the inequality of two terms is called their *ratio*. An expreſſion much more frequently uſed than clearly underſtood. We ſhall not need to trouble ourſelves with any other than the plaineſt and moſt ſimple idea of it, which the practice of the rule of three conveys.

When we ſay in the rule of three; as the firſt term is to the ſecond, ſo is the third term to the fourth, we mean that in what manner ſoever the whole, or any aſſignable part of the firſt term is contained in the ſecond; in the ſame manner muſt the whole or the like part of the third term be contained in the fourth: or, in other words, we mean that the quotient of the firſt term divided by, or dividing, the ſecond, muſt be the ſame with the quotient of the third term divided by, or dividing, the fourth: and when this is the caſe, we ſay the *ratio* of the firſt to the ſecond is the ſame as the *ratio* of the third to the fourth term.

This is obvious, that the equality of the quotients reſulting from a diviſion of the terms, denotes an equality of the ratios of ſuch terms: and that the greater or leſs quotient denotes a greater or leſs ratio, and conſequently a greater or leſs muſical interval, which will ſerve all our purpoſe at preſent.

50. Thoſe who have a mind to look farther into the analogy between the magnitude of muſical intervals, and that of the ratios of the iſochronous parcels of their terminating ſounds, will find, that although the ratio increaſes when the quotient increaſes, and *vice verſa;* yet the augmentation of the ratio does not keep due pace with that of the quotient, ſo as to remain always in one certain proportion with it. Suppoſe the terms equal, and therefore the quotient unity, the ratio is nothing, and the muſical interval is alſo nothing.—If the terms be as 1 to 2, and the ratio, or, which is the ſame thing, the interval be called one (ſay one octave), then the terms 1 to 4 will include a double interval (two octaves); the terms 1 to 8 will include a triple interval (three octaves); and

1 to 16 a quadruple interval; and ſo on: where the leſs term being always unity, the greater term is alſo the quotient; and it is obſervable, that for every one octave which the interval increaſes, the quotient of the terms becomes the double of what it was. The quotients increaſe by a redoubled geometrical progreſſion, 1. 2. 4. 8. 16. *&c.* while the intervals increaſe only in the natural order of the numbers, 1. 2. 3. 4. *&c.* Thus it will be, whatever other interval we pitch upon, inſtead of the octave. The double interval will always exiſt when the quotient of the terms becomes duplicate, that is, the ſquare of that which ariſes from the terms of the ſingle interval; and the triple interval will require a quotient triplicate, or the third power of the firſt, and ſo on.

Thus the progreſſion of intervals, and their correſpondent quotients, exactly anſwers to that of Logarithms, and their correſpondent natural numbers; as thoſe who underſtand the nature of logarithms will immediately perceive from the above.

The line of numbers, called *Gunter's line*, is ſtill more eaſily applied to the uſe of attaining proper ideas of the magnitudes and proportions of intervals: for here the real magnitude of every interval is repreſented by the diſtance between the two numbers which expreſs its terms; ſo that nothing could be deviſed more ſuitable for this purpoſe.

51. The muſical interval, or *ratio*, between two numbers is not altered by multiplying or dividing both its terms by any one number whatever; the effect of which is only making the terms larger or leſs, but ſtill retaining the ſame proportion: therefore a muſical interval may be reduced into ſmaller numbers by diviſion, if both its terms have any common diviſor. Farther, as all harmonic numbers muſt be compoſed of the ſmall primes 2, 3, 5, and 7, therefore a muſical interval will be reduced into its ſmalleſt numbers by firſt dividing both its terms by 2, or ſome power of 2, continually, as often as this can be done without any remainder; afterwards by 3, or ſome power of 3, as often as this can be done; and afterwards by 5, or 7, if either of theſe will divide both terms.

For example, the interval between the key and ſeventh, which, in Art. 44th, is 96 to 90, by dividing both terms by 2, becomes 48 to 45: theſe cannot both be divided by 2 any more, but divided by 3, give 16 to 15; which numbers we can reduce no lower, becauſe they have no common diviſor; therefore the interval, or ſemitone, between the key and the ſeventh is expreſſed, in its ſmalleſt numbers, by the ratio of 16 to 15.

This proceſs of reducing ratios to their ſmalleſt numbers, we ſhall not hereafter inſert at length, becauſe our readers may be ſuppoſed well enough acquainted with it, from its correſpondence with the method of reducing vulgar fractions to their leaſt terms: and ſuch as are not, need only to follow the above directions, which are ſufficient for all caſes that can occur among harmonic numbers.

52. ADDITION of intervals teaches how to find an interval, which ſhall be equal to the ſum of two or more given ones, and anſwers exactly to addition, or rather *compoſition*, of ratios. This, when the greater term of one interval is the ſame with the leſs term of another to be added; or, which comes to the ſame thing, when the intervals to be added lie contiguous one to another in the ſcale, is no more than comparing the iſochronous parcels of the extreme terms one with the other. Thus, the interval between the key and third, 48 to 60, added to that between the third and fifth, 60 to 72, evidently makes the interval between the key and fifth, *viz.* 48 to 72; which reduces to that of 2 to 3.

53. Any two intervals may be added, though the greater term of one be not the ſame with the leſs term of the other, in the given expreſſions; but then they muſt firſt be reduced to this form, by ſeeking a common multiple of theſe two terms, and multiplying both terms of one ratio by ſuch a num-

ber as will raiſe its greater term to that multiple, and both terms of the other ratio by ſuch a number as will raiſe its leſs term to the ſame multiple; after which their ſum will be had by comparing the extremes, as before. This proceſs agrees exactly with multiplication of vulgar fractions, conſidering the leſs term of each ratio as a numerator, and the greater term as its denominator; but as the addition of intervals which are not to be found contiguous to each other in ſome part of the ſcale, ſerves only to find expreſſions of *unnatural* or inharmonical relations, we ſhall not need to inſiſt upon this particular.

54. The addition of one or more octaves to any given interval is performed by halving the leſs, or doubling the greater term, for every octave to be added. Thus the interval of a perfect fifth being 2 to 3, that of an octave and fifth, or a double fifth, ſee Part. I. Art. 130. is 1 to 3; and that of a triple fifth is 1 to 6. Again, the interval of a fundamental great third being 4 to 5, that of a double great third is 2 to 5; and of a triple great third is 1 to 5.

55. SUBTRACTION of intervals teaches how to find an interval which ſhall be equal to the difference of two given ones; and anſwers to ſubtraction, or *reſolution*, of ratios. Here, if either the greater or the leſs terms be the ſame in both expreſſions, or if one interval make either an upper or lower part of the other in the ſcale, the difference will be had by inſpection: thus, to find the difference between a fundamental great third and a perfect fifth; as the former of theſe is 48 to 60, and the latter is 48 to 72, in the ſcale; ſo their difference is 60 to 72, which reduces to 5 to 6.

56. The difference of any two intervals may be found, though neither the greater nor the leſs terms be the ſame in the given expreſſions, by a previous reduction, like that in addition, Art. 53. Thus, ſeek firſt a common multiple of the leſs terms of each interval, then multiply both terms of one ratio by ſuch a number as will raiſe its leſs term to that multiple, and both terms of the other ratio by ſuch a number as will raiſe its leſs term to the ſame multiple; after which their difference will be had by comparing the greater terms one with the other: and this proceſs agrees with diviſion of vulgar fractions, as that in Art. 53. did with multiplication. This method of ſubtraction being of as little uſe, in our way of repreſenting ſounds, as the addition to which it correſponds, we ſhall only obſerve, by the way, that ſince muſical intervals are proportional to the logarithms of the value of their terms placed fraction-wiſe, Art. 50; it plainly follows, that addition of intervals muſt anſwer to multiplication of theſe fractions, and ſubtraction of intervals to diviſion.

57. To ſubtract one or more octaves from any given interval, which is properly only bringing the terms nearer to each other, by ſteps of an octave each, we may either double the leſs, or halve the larger term, for every octave to be ſubtracted. This, being extremely obvious, has been already exemplified, in Art. 41.

58. To find an interval which ſhall be double, or triple, or quadruple, *etc.* of a given one, which may be called MULTIPLICATION of an interval by 2, or 3, or 4, *etc.* we muſt raiſe both the terms of the given interval to the ſecond, or third, or fourth power, *etc.* reſpectively. This rule is a direct conſequence from the foregoing, but is of no uſe with us, except in caſes where the required powers of both numbers, which expreſs the ſimple interval, are alſo ſuch as conſtitute eligible parcels, and on that account are harmonic numbers. Thus, the interval of a perfect fifth being expreſſed by 2 to 3, that of two contiguous fifths, or a ninth, will be 4 to 9; three contiguous fifths, or a thirteenth will be 8 to 27; and ſo on.

59. To find an interval which ſhall be the juſt half, or third part, *etc.* of a given one, may be called DIVISION of

an interval by 2, or 3, *etc*; and this is done by extracting the ſecond or third root, *etc.* of both the terms, reſpectively. This rule proves alſo uſeleſs with us, except the terms which expreſs the total interval be juſt powers of the ſame denomination with the part required. Thus the interval 64 to 81 may be halved, and its half will be 8 to 9; becauſe 64 is the ſecond power of 8, and 81 is the ſecond power of 9. Thus alſo the third part of the interval 8 to 27 will be 2 to 3, or a perfect fifth; becauſe thoſe terms are juſt the third roots of the former, reſpectively: but the half of an interval, whoſe terms are not juſt ſquare numbers, or the third part of an interval, whoſe terms are not juſt cube numbers, cannot be expreſſed in harmonic numbers, nor indeed in any others; and is therefore a relation which, in our way of conceiving ſounds, has no place in muſic.

60. It is farther to be obſerved, in regard to the comparative magnitudes of different intervals, that when the terms of one interval are not ſome juſt power of thoſe of another; or, when one interval does not exactly divide another, as above, it is impoſſible to expreſs the comparative magnitudes of ſuch intervals exactly, by the proportions of one number to another. But the magnitudes of muſical intervals being exactly proportional to the logarithms of the quotients of their terms, Art. 50. that is, to the differences of the logarithms of their terms; we can, by this means, eaſily obtain numeral expreſſions correſponding to each interval, to a ſufficient degree of exactneſs. For example, ſuppoſe the logarithm of 2 (which is the quotient of the terms of an octave) to repreſent an octave; the difference of the logarithms of 5 and 4 will repreſent a fundamental great third. Thus,

The log. of 2, *viz.* .3010300 repreſents an octave.

The log. of 5 .6989700
The log. of 4 .6020600 ſubt.

The differ. *viz.* .0969100 repreſents a fund. gr. third.

Therefore the interval of an octave, is to a great third, as 30103 to 9691. After the ſame manner all other intervals may be repreſented and compared; and the arithmetician will eaſily ſee that by this means all queſtions relating to their comparative magnitudes may be expeditiouſly ſolved, to great exactneſs.

61. Computations of this kind may be ſtill ſhortened, but with leſs exactneſs, by uſing ſuch ſmall numbers as ſhall approach nearer than any other, not exceeding them, to the ratio of the large numbers obtained, as above, from the logarithms.

The method of finding ſuch ſmall numbers, being of excellent uſe in many other philoſophical calculations, and tho' very eaſy, yet not commonly taught, we ſhall here inſert the proceſs, nearly the ſame as directed by Mr. Cotes in his *Harmonia Menſurarum*, Prop. I. Schol. 3.

Divide the greater term by the leſs; then the diviſor by the remainder; then the laſt diviſor by the laſt remainder; and ſo on, after the ſame manner as in ſeeking the greateſt common diviſor of the two terms: the quotients of theſe ſucceſſive diviſions will be the numbers from which to form two columns, one containing ratios greater, and the other ratios leſs than true; but both approximating nearer to the true, as the numbers grow larger; and each expreſſion being nearer than any other which could be formed of ſmaller numbers. Thus for the firſt ratio greater than true, put 1 : 0; and for the firſt leſs than true put the firſt quotient : 1. Then for the next ratio greater than true, multiply the terms of this laſt ratio by the ſecond quotient, and, carrying the products over to the other column add them to the terms of the ratio already put in that column: and, for the next ratio leſs than true, multiply the terms of this laſt found ratio by the third quotient, and carrying the products over again to the other column, add them to the terms already put in that column: and ſo proceed always multiplying the terms of the laſt found ratio by the next quotient, carrying the products over to the other column, and adding them to the terms of the laſt ratio in that column, for a new ratio.

For example: by proceeding in this manner with the ratio of an octave to a great third, found above, *viz.* 30103 to 9691, we get firſt this ſucceſſion of quotients, 3, 9, 2, 2, 4, *etc.* whence we derive the following expreſſions.

Ratios greater than true.	Ratios leſs than true.
1 : 0	3 : 1 x 9
27 . 9	56 . 18
28 : 9 x 2	59 : 19 x 2
118 . 38	584 . 188
146 : 47 x 4	643 : 207
&c.	&c.

From this proceſs we find that the ratio of 3 to 1 is leſs; that of 28 to 9 is greater; that of 59 to 19 is leſs; that of 146 to 47 is greater; and that of 643 to 207 is leſs, than the true ratio of an octave to a great third. Or, we find that an octave contains 3 great thirds, and leſs than one ninth part of a great third, but more than two nineteenth parts, leſs than five 47th parts, but more than twenty-two 207th parts of a great third.

62. For a particular application of the rules delivered above, we have here annexed a ſcheme of the ſyſtem of modulation of C, as a principal key; which may equally ſerve for that of any other key, by only changing the letters, *&c.* according to the rules of tranſpoſition, formerly given.

SCHEME of the SYSTEM of MODULATION of C.

N°																						
1	IV.	*t. g.*	V.	*t. l.*	VI.*ſ.d.*	VII♭.	*t. r.*	K.	*t. g.*	II.	*t. l.*	III.*ſ.p.*	IV.	*&c.*	Scale of the adjunct fourth.							
2	32.		36.		40.	42.	45.	48.	50.	54.		60.	64.		72.		80.	84.	90.	96.	100.	108.
3	F.		G.		A.	b♭.	B.	C.	c※.	D.		E.	F.		G.		A.	b♭.	B.	C.	c※.	D.
4					Medial			48.		54.		60.	63.		72.		81.		90.	96.		
5	Scale of the prin. Key							K.	*t. g.*	II.	*t. l.*	III.*ſ.d.*	IV.	*t. r.*	V.	*t. g.*	VI.	*t. l.*	VII.*ſ.p.*	K.	*&c.*	
6					Final			64.		72.		80.	84.		96.		108.		120.	128.		
7			G.	g※	A.		B.	C.		D.	d※.	E.	F.	f※.	G.	g※.	A.		B.	C.		D.
8			48.	50.	54.		60.	63.		72.	75.	81.		90.	96.	100.	108.		120.	126.		144.
9			V.	*t. g.*	VI.	*t. l.*	VII.*ſ.d.*	K.	*t. r.*	II.	*t. g.*	III.	*t. l.*	※IV.*ſ.p.*	V.	*&c.*	Scale of the adjunct fifth.					

63. For underſtanding this ſcheme it muſt be carefully obſerved,

(1.) That the degrees of the ſcale are here denoted by numeral letters, inſtead of figures, to avoid the confuſion of too many figures.

(2.) That ſuch of theſe degrees as occaſionally become grave or acute, in ſome of the ſcales, are marked with the proper accents over them.

(3.) That the names of the intervals, or ſteps, from each degree to the next are denoted by ſmall Italic letters put between them: thus *t. g.* ſtands for a greater tone; *t. l.* for a leſs tone; and *t. r.* for a redundant tone: *ſ. p* ſtands for a proper ſemitone; and *ſ. d.* for a deficient ſemitone. We ſhall ſpeak below of the magnitude of each of theſe.

(4.) That the numbers which ſtand in every alternate line ſhew the iſochronous parcels of vibrations of the degrees of the ſcale which ſtands over or under them: and becauſe the ſcale of the principal key is one way formed with regard to the adjunct fourth, and another way with regard to the adjunct fifth, Art. 45; the numbers belonging to the ſcale of the key, in the former caſe, are put above, with the title of *medial;* and thoſe belonging to the ſame ſcale, in the latter caſe, are put below, with the title of *final;* this being the ſcale with which we are always obliged to conclude.

(5.) The meaning of the lines of letters is obvious, only it may be obſerved, that the ſharp fifth of each ſcale is added among the letters which ſtand below it, and its iſochronous parcel among the numbers; though no notice is taken of them in the ſcales themſelves. Thus, among the upper row of letters we have put c※, being the ſharp fifth in the ſcale of the adjunct fourth; and among the lower row, g※, and alſo d※; the former of theſe being the ſharp fifth in the ſcale of the key, and the latter the ſharp fifth in the ſcale of the adjunct fifth.

64. Theſe things being premiſed, it will be proper for the ſtudent firſt to ſeek out the component factors of each number in the ſcheme, in order to be aſſured that they are all *harmonic numbers*, according to the characteriſtics given in the firſt and ſecond chapters. Thus, 32, 64, and 128 are juſt powers of 2.—— 48, and 96 are powers of 2, multiplied by 3. —— 36, 72, and 144 are powers of 2, multiplied by the ſquare of 3 (9) ——54, and 108 are powers of 2, multiplied by the cube of 3 (27)—— 81 is the fourth power of 3. All theſe numbers are therefore compoſed of the ſmalleſt primes 2 and 3.

Farther, the numbers 40 and 80 are powers of 2, multiplied by 5.——60, and 120 are powers of 2, multiplied by 3 x 5 (15) ——45 is 3 x 3 x 5, and 90 is the ſame doubled. ——50, and 100 are powers of 2, multiplied by 5 x 5 (25). ——75 is 3, multiplied by 5 x 5. Some of theſe numbers include 5, and others the ſquare of 5, along with 2 or 3.

Again, 42 and 84 are powers of 2, multiplied by 3 x 7 (21). —— 63 is the ſquare of 3, multiplied by 7, and 126 is the ſame doubled. Here we have 7 included along with 2 or 3.

Theſe are all the numbers in the ſcheme, and thus they are all found to be harmonic numbers.

65. It is farther to be obſerved, that if we exclude the third power of 5, the ſecond power of 7, and the product of 5 x 7, which it is reaſonable to ſuppoſe we ought to do, becauſe the larger factors cannot be ſo often compounded as the ſmaller ones, without becoming too complex to be received; we ſhall then find that the ſcheme contains all the poſſible harmonic numbers between 32 and 144, *viz.* between the loweſt and the higheſt number in it; except ſuch as might be formed of the powers of 2, multiplied ſimply by 7; and theſe numbers we ſhall hereafter ſhew, have no place in our muſic.

66. In regard to the intervals, or ſteps of the ſcale, it muſt be remembered, that a great tone may always be repreſented

by 8 to 9; a leſs tone by 9 to 10; and a proper ſemitone, by 15 to 16: a redundant tone, by 7 to 8; and a deficient ſemitone, by 20 to 21. And if the iſochronous parcels of any two contiguous degrees in the ſcheme be reduced into their ſmalleſt numbers, as directed in this chapter, the reſult will always be ſome one of the above proportions, *viz.* that which correſponds with the ſpecies of tone or ſemitone, which is marked between the ſame degrees, in the ſcheme. Thus, the two firſt numbers in the ſecond line, *viz.* 32 and 36, by reduction, become 8 and 9, correſponding to a great tone, as marked between the IV and V in the firſt line. Proceeding forward in the ſame lines, 36 and 40, by reduction, become 9 and 10; anſwering to the leſs tone between V and VI: Again 40 and 42, by reduction, become 20 and 21; anſwering to the deficient ſemitone between VI and VII♭: and 42 and 48 are reducible into 7 and 8, anſwering to the redundant tone between VII♭ and K; (the number 45, which ſtands between the other two, not being taken any notice of, in the ſcale above it). After the ſame manner 48 and 54 (neglecting the 50 which ſtands between them) are reducible into 8 and 9, anſwering to the great tone between the K and II.

In this manner the ſtudent may, at his leiſure, examine all the other contiguous degrees in each of the three ſcales, by their numbers; and ſuch an examination will be the more uſeful as it will tend to familiarize the compoſition of harmonic numbers, and to fix the numbers themſelves in the learner's memory.

67. The ſteps of each of the three ſcales are exactly the ſame, and in the ſame order, viz. *t, g: t, l; ſ, d; t, r; t. g; t, l; ſ, p.* This order agrees exactly with that which has formerly been eſtabliſhed by the writers on this ſubject, except in the fourth of the ſcale, which we make a *grave*, inſtead of a *perfect fourth;* and hence ariſes the deficiency of the ſemitone next below, and the redundancy of the tone next above it: for if the fourth were made perfect, the ſemitone below it would be a proper ſemitone, 15 to 16, and the tone above it would be an exact great tone, 8 to 9: as will eaſily appear by ſubſtituting 64 inſtead of 63, in the medial ſcale of the principal key, *viz.* the 4th line of the ſcheme. Our reaſons for this innovation will be ſeen in the following chapter.

68. From this arrangement of the ſteps of the ſcale there ariſe two different ſorts of great thirds, and three different ſorts of leſs thirds; all of which have their uſe in muſic. The proportion of 4 to 5 we call a fundamental great third, and this exiſts between the K and III, and between the V and VII of the ſcale. The proportion of 7 to 9 we call a redundant great third, and this exiſts only between the grave IV and the acute VI of the ſcale. Here it is neceſſary to obſerve, that the flat VII of the ſcale is naturally and immutably a grave fourth; and the II of the ſcale is naturally an acute ſixth in reſpect to the adjunct IV as a new key; and that every grave fourth includes the number 7. The proportion of 5 to 6 we call a ſuperſtructed leſs third, becauſe it always lies between the fundamental great third and the fifth; and this exiſts between the III and V, and between the VII and II of the ſcale. The proportion of 6 to 7 we call a deficient leſs third, and this is found only between the II and the grave IV of the ſcale. The proportion of 27 to 32, which exiſts between the acute VI and the K, repreſents the fundamental leſs third of the flat ſeries, of which we have to ſpeak hereafter.

69. The ſame arrangement produces one redundant and one deficient fifth, beſides that which is well known by the title of the falſe fifth. The redundant fifth exiſts between the grave IV and the K; and has its terms in the proportion of 21 to 32. The deficient fifth is between the acute VI and the III, and is as 27 to 40. The falſe fifth, between the VII and the grave IV, is as 5 to 7.

All the other fifths in the ſcale are perfect, in the proportion of 2 to 3: and, in practice, the redundant and deficient fifths, mentioned above, are alſo rendered perfect, by the occaſional temperament of one of their ſounds.

70. The inverſions of the different ſorts of thirds produce as many different ſorts of ſixths; but as all inverted chords are of the ſame nature and produce much the ſame effects as the erect chords from which they are derived, we ſhall not trouble the learner with a particular name to each of theſe ſixths; but rather denominate them by the thirds from which they are derived.

Now, to expreſs the inverſion of any chord leſs than octave, we have only to compare half the upper term, if it be an even number, with the ſame lower term; or to compare double the lower term, with the ſame upper term, if it be an odd number: this being in effect either carrying the upper term an octave lower, or the lower term an octave higher. Thus the ſixth inverted from the fundamental great third 4 to 5, is 5 to 8; and this exiſts between the III and K, and between the VII and V. The ſixth inverted from the redundant great third 7 to 9, is 9 to 14; and this exiſts between the acute VI and the grave IV. The ſixth inverted from the ſuperſtructed leſs third 5 to 6, is 3 to 5; and this exiſts between the V and III, and between the II and VII. After the ſame manner 7 to 12 is the inverſion of the deficient leſs third, and 16 to 27, that of the fundamental leſs third, of Art. 68.

71. We ſhall next take a ſurvey of the ſmall differences of the tones, ſemitones, and other intervals, mentioned above.

(1.) The acute note exceeds the natural note of the ſame name by the difference of a *comma*, 80 to 81. This appears at the ſecond A in the third line of the ſcheme; which, as a natural VI, takes the parcel 80, above it, and as an acute VI the parcel 81, below it. The ſame difference of natural and acute appears again at E, in the ſeventh line; and is denoted by the ſame numbers above and below it. See alſo Art. 41.

(2.) The grave note falls ſhort of the natural note of the ſame name by the difference of a *bearing*, 63 to 64. This appears at the ſecond F, in the third line; and again at the C, in the ſeventh line of the ſcheme. See alſo Art. 44.

(3.) The greater tone exceeds the leſs tone by a *comma*. This may be found by ſubtracting 10 : 9 from 9 : 8, by the rule, Art. 56; and appears in the ſcheme between the ſecond occurrence of G and A in the third line; and between D and E in the ſeventh line; for in theſe occurrences the natural upper note makes a leſs tone, and the acute upper note a greater tone, while the lower note remains the ſame.

(4.) The redundant tone exceeds the greater tone by a *bearing*. This is ſeen at C, D, in the ſeventh line of the ſcheme; where the natural C is a greater tone, and the grave C a redundant tone, below D.

(5.) The proper ſemitone exceeds the deficient ſemitone by a *bearing*. This is ſeen at E, F, in the third line; where the natural F is a proper ſemitone, and the grave F a deficient ſemitone, above E.

72. The differences of all larger intervals of the ſame name will ſtill be either a comma or a bearing, or both theſe, ſome way compounded; becauſe all larger intervals are made up of ſingle degrees, and muſt therefore be affected with the ſame differences as the degrees which compoſe them. We ſhall juſt mention a few of theſe differences, which are of the moſt importance to be known and remembered; and leave it to the ſtudents own induſtry to find them out in the ſcheme, and to extend the ſame enquiry to other intervals, as he thinks proper.

(1.) The redundant great third exceeds the fundamental great third, by the difference of 35 to 36; which is the ſum of a bearing and a comma.

(2.) The deficient leſs third falls ſhort of the ſuperſtructed leſs third, by the ſame quantity.

(3.) The fundamental leſs third falls ſhort of the ſuperſtructed, by a comma; and exceeds the deficient, by a bearing.

(4.) The redundant fifth is a bearing more, and the deficient fifth is a comma leſs than the perfect fifth.

Theſe are ſome of the moſt material *ſmall*, and hitherto almoſt *unobſerved* differences of intervals; and he who has the method of aſcertaining theſe can be at no loſs for the larger differences between intervals of different names; ſo that we ſhall not give any particular detail of them at preſent.

73. To finiſh this chapter with a praxis to the rules relating to the compariſon of muſical intervals, Art. 60 and 61, ſuppoſe it be required to find how many commas and decimals of a comma, are in every ſtep of the natural ſcale.

This may be done by firſt ſeeking how many commas make a bearing, a deficient ſemitone, and a leſs tone; and afterwards all the other ſteps are eaſily made up, from theſe, by addition

(1.) For the Comma.

Log. 81	1.9084850
Log. 80	1.9030900
Diff.	53950

(2.) For the Bearing.

Log 64	1.8061800
Log. 63	1.7993405
Diff.	68395

(3.) For the def. ſemit.

Log. 21	1.3222193
Log. 20	1.3010300
Diff.	211893

(4.) For the leſs tone.

Log. 10	1.0000000
Log. 9	0.9542425
Diff.	457575

Now, the quotient of 68395, divided by 53950, *viz.* 1.2677, ſhews the commas and decimals in a bearing.

The quotient of 211893, divided by 53950, *viz.* 3.9276, ſhews the commas and decimals in a def. ſemitone.

The quotient of 457575, divided by 53950, *viz.* 8.4815, ſhews the commas and decimals in a leſs tone.

To the def. ſemit.	3.9276	
add the bearing	1.2677	
The ſum is	5.1953	the commas in a proper ſemitone.

To the leſs tone	8.4815	
add one comma	1.	
The ſum is	9.4815	the commas in a great tone.
add the bearing	1.2677	
The ſum is	10.7492	the commas in a redundant tone.

For proof of the above work, range theſe quantities one below another, as their correſpondent intervals occur in the ſcale, and then add them together; thus,

	Commas.	
Proper ſemitone	5.1953	C to B.
Leſs tone	8.4815	B to A acute.
Greater tone	9.4815	A to G.
Redundant tone	10.7492	G to F grave.
Deficient ſemitone	3.9276	F to E.
Leſs tone	8.4815	E to D.
Greater tone	9.4815	D to C.
The ſum	55.7981	is the commas in an octave.

Divide now the octave 3010300, (ſee Art. 60.) by the comma 53950, and it will yield the ſame quotient, within one five thouſandth part of a comma; which proves the truth of the whole.

CHAP. IV. *Of* COMBINED SOUNDS.

Article 74. WHEN two different ſounds are heard together, their combination always either really produces, or eſſentially implies, a third ſound, whoſe vibrations are equal to the difference of the vibrations of the two ſounds, in the ſame time. Thus C, 64, heard together with G, 96, (ſee the 6th and 7th lines of the ſcheme, Art. 62.) produces 32; which is C an octave below: and C, 64, heard along with E, 80, produces 16, which is C, a double octave below. We take theſe examples in the large numbers of the ſcheme; but the reſult will be the ſame if the intervals be expreſſed in their ſmalleſt numbers. Thus, the perfect fifth, whoſe terms are as 2 to 3, produces 1, which is an octave below the lower term; and the fundamental great third, whoſe terms are as 4 to 5, produces 1, which is a double octave below the lower term. After the ſame manner the produced or implied ſound of every other interval may be aſcertained.

75. We are the leſs ſollicitous to account for this effect upon philoſophical principles, becauſe the fact is confirmed by experience, and is introduced as an eſſential principle of harmony by M. Serre of Geneva, in a ſyſtem printed at Paris 1753, intitled, *Eſſais ſur les principes de l'harmonie;* and by M. Tartini, to whom the firſt diſcovery of it is attributed, and whoſe experiments are related in the *Encyclopedie,* under the article *Fondamental,* and his whole ſyſtem briefly explained in Mr. Rouſſeau's *Dictionaire de Muſique,* under the article *Syſteme.* The ſenſe of his aſſertion relating to this matter is as follows.

"Whenever two *loud, uniform,* and *continued* ſounds are "heard together, there reſults from their claſhing [*choc*] a "third ſound, more or leſs perceivable, in proportion to the "ſimplicity of the relation of the two former ſounds, and to "the delicacy [*fineſſe*] of the ear of the hearer.

"To render this experiment the moſt perceivable, ſet two "hautbois, well tuned, ſome paces aſunder, and place your"ſelf between the two, at equal diſtance from each. Inſtead "of Hautbois one may take two violins, which, although "their ſounds are weaker, will, by playing ſtrong and uni"form, [*en touchant avec force et juſteſſe*] be ſufficient to make "the third ſound diſtinguiſhable."

M. Rouſſeau then proceeds to ſpecify the third ſound produced by each of the concords, according to M. Tartini; and in every one of them, it is aſſigned juſt an octave higher than that which ariſes from the difference of vibrations, as above, Art. 74. We ſhall leave it to the curious to determine whether this can be accounted for by conſidering the courſe and recourſe of each particle of air, which together conſtitute only one pulſe, as each producing a ſimilar and equal effect on our organs of hearing, ſo that we perceive two coincidences for every one pulſe which the acuter term gains; and that theſe coincidences become, as it were, the pulſes of a feeble grave ſound, generated by the combination of the other two; which may be actually heard in the ſituation and circumſtances above deſcribed. M. Tartini attempts no phyſical explication of this matter, but M. Serre expreſly derives the generated third ſound from the coincident vibrations of the two generating ſounds: and to remove an objection which naturally occurs, and which M. Rouſſeau adds at the foot of the article *Battemens*, againſt this hypotheſis, *viz* that the real coincidences of vibrations occur moſt rarely when two ſounds approach neareſt to the true ratio of a concord, but yet differ ſome very little from it; and therefore one would think that the generated third ſound ſhould vaniſh away, as the two ſounds drew near to a perfect concord, and preſent itſelf again at the inſtant the concord became juſt: let it be obſerved, that although the *real* coincidences happen ſeldom, yet the apparent or *ſenſible* coincidences fall out nearly in the ſame order, whether the ratio of the vibrations be the exact ratio of a concord, or only near to it: with this difference only, that when the ratio is perfect, theſe coincidences follow each other in a regular and uninterrupted ſucceſſion; whereas, if the ratio be imperfect, the ſucceſſion of apparent coincidences, after continuing for a little time, is interrupted for a little time, and then takes place again, and ſo on: and theſe periodical continuances and interruptions occur more frequently as the difference from the true ratio is greater; and are the very cauſes of the ſenſation which Dr. Smith calls the *beating* of imperfect conſonances.

Now, according to the hypotheſis of M. Serre, the third ſound ought to preſent itſelf during the continuance of the ſenſible coincidences, and to diſappear during their interruption; ſo that the difference between a perfect and an imperfect concord is no more than this, the perfect concord produces an uniform and uninterrupted third ſound, and the imperfect produces the ſame third ſound periodically interrupted; and this being preciſely the caſe in nature, it is a ſtrong proof that the hypotheſis is right.

If we ſuppoſe any analogy to exiſt between the perception of different combined ſounds, and the viewing of different motions in one and the ſame direction, it may be infered, that as the velocity with which one moving body approaches towards or recedes from another (which may be called its relative motion, and is equal to the difference of the two abſolute motions,) is a circumſtance which always attracts part of our regard; ſo the difference of the vibrations, or the relative velocity of the pulſes of one ſound in compariſon to thoſe of the other, may ſome way be perceived, abſtract from all conſiderations either of *real* or *ſenſible* coincident pulſes: and the ſcience of muſic may probably receive conſiderable improvements from a critical enquiry into theſe matters, by ſuch as are qualified for it.

76 We ſhall proceed to ſhew the conſequences of theſe generated or implied ſounds in the chord called *the perfect chord*, Part. I. Art. 127. which is the final or concluding chord of all ſharp harmony. The perfect chord in its moſt complete and natural arrangement, has the fundamental ſound, or key note, for its baſs; above which ſtand the ſingle octave, double fifth, double octave, and triple greater third; ſee Part I. Art. 130. to 134. The proportions of theſe ſounds, expreſſed in their ſmalleſt numbers, are, 1, 2, 3, 4, and 5, reſpectively; *viz.* ſuppoſe the fundamental to be repreſented by 1; its ſingle octave will be 2; its double fifth, 3; its double octave, 4; and its triple greater third, 5.

The ſimplicity of the mutual relations of the ſounds expreſſed by this progreſſion of ſmall numbers is, in part the reaſon of their being heard together with ſatisfaction, or conſtituting an agreeable chord; but beſides this, it is alſo neceſſary to take into conſideration the implied ſounds, ariſing from the mutual differences of the terms, in order to prove that this chord brings with it no idea foreign to the natural conſtitution of the key, and therefore is perfectly concluſive when applied to the key as fundamental

Now, it is plain that the difference of any two terms in this progreſſion, 1. 2. 3. 4. 5. any way taken, will always be equal to ſome one of the terms themſelves; *viz.* either 1, or 2, or 3, or 4. Thus the difference of any two adjacent terms is always 1, and conſequently any two adjacent ſounds will always generate the fundamental. The difference of any two terms, ſeparated by an interjacent term, is always 2, or the octave above the fundamental. The difference of any two terms, ſeparated by two interjacent terms, is always 3, or the double fifth to the fundamental: and the difference of two terms, ſeparated by three interjacent terms, is 4, or the double octave to the fundamental.

From hence it appears that the implied ſounds, in this perfect chord, produce no other effect than that of fortifying, or *doubling*, all the real ſounds of the chord, except the higheſt. It is further to be obſerved, that the difference between two adjacent terms will always be more remarkable than that between two terms which are ſeparated by one or more interjacent; and alſo that the generated ſound is more perceivable when it falls below both the generating ſounds, than when it falls between them; conſequently as every two adjacent terms, in the above chord, generate the fundamental, or loweſt ſound, 1; this fundamental will be much more remarkably fortified than any of the other ſounds.

77. All theſe circumſtances are exactly agreeable to the natural conſtitution of the key. For,

(1.) The octaves in the accompanyment are perfectly natural to the key; becauſe the manner of parcelling the vibrations of the key, by continual reduplication, as formerly deſcribed, eſſentially implies the co-exiſtence of all its octaves, both above and below, not exceeding the limits of audible ſound.

(2.) The key muſt be the principal object of our attention; which is inevitably the caſe when the perfect chord is applied to it; not only on account of the octaves in the accompanyment, but alſo on account of the generated ſounds, as above.

(3.) The perfect fifth and fundamental great third are admitted along with the key, in modern harmony, but only as dependent ſounds, or *harmonics*; becauſe it is eaſy to admit three inſtead of two, or five inſtead of four; as already ſhewn: and the double fifth, and triple great third, are preferable to the ſingle intervals of the ſame names, becauſe of the regular progreſſion which is thereby formed.

78. It may be aſked why this progreſſion is not farther continued? and why the ſounds repreſented by 6 and 7 are not admitted in the perfect chord, along with thoſe repreſented by the ſmaller numbers? To this it is ſufficient to anſwer, that 6, being the octave of 3, *viz.* the fifth, cannot be admitted without rendering the ſame fifth too remarkable, and thereby taking off its dependance on the key. See Part I. Art. 142. And that 7, being a difficult factor in the parcelling of vibrations, produces a ſound difficult to be ſung, and unſatisfactory, except when it can be properly followed by another more eaſy ſound, in the way of *reſolution*: on which account it cannot have place in a final chord.

79. The predominancy of the ſounds of this perfect chord among the *natural conſonances* of every muſical ſound, obſerved, Part I. Art 137. is a neceſſary conſequence of the ſmallneſs of the numbers which expreſs their relations: for in the production of every muſical ſound the air is agitated by a variety of other impulſes, beſides thoſe of the principal and uniform vibrations by which we eſtimate the tone; as will plainly appear by conſidering what muſt inevitably happen to the

air within the ſound box of any ſtringed inſtrument: for as the vibrations of ſounds are again and again reflected by ſtriking againſt the back, or the ſides, or the belly of the ſound box, this will occaſion the air within the box to partake of an infinity of different vibratory motions, croſſing and intermixing with each other in the moſt complicated manner imaginable; and the ſame complicated motions will be communicated to the contiguous air, and propagated along with the uniform vibrations of the ſtring, from whence will ariſe a multiplicity of ſounds, acuter than the principal, and in due ſubordination one to another: thoſe whoſe relations to the principal ſound are expreſſed in the ſmalleſt numbers, and whoſe vibrations therefore do moſt frequently coincide with the principal, being thereby kept up and preſerved, while thoſe whoſe vibrations more rarely coincide with the principal are deſtroyed.

One may venture to aſſert, that except the air be thus agitated, and put into a kind of *ferment*, no muſical ſound can be produced; elſe why does not a ſtretched ſtring yield its ſound when apart from a ſounding box or board? as when a weight is hung by it from a hook in the middle of the roof of a room. The ſtructure of different inſtruments occaſions their ſounds to be more or leſs compounded; thus the ſounds of a German flute are leſs compounded than thoſe of a common flute, and theſe laſt much leſs than thoſe of a hautbois, becauſe the trembling of the edge, which cuts the blaſt in wind-inſtruments, has a conſiderable ſhare in introducing theſe conſonant vibrations; and this, joined with the additional agitations which the air afterwards ſuffers within the pipe, ſerves them inſtead of any other ſound box: and the edge which cuts the blaſt in a German flute is leſs pliable than that in a common flute, and this laſt is much leſs pliable than the reed of a hautbois.

It may be further obſerved, that the conſonances of any muſical ſound, whether inſtrumental or vocal, are much leſs diſtinguiſhable in the open air than in a room; becauſe the reflection of the ſound, from all parts of the room, contributes towards the breaking and ſubdividing the total vibrations. The conſonances of every ſpecies of muſical ſounds alſo become more perceivable as the principal ſound itſelf is made graver in its tone. Thus we can ſcarcely eſtimate the pitch of the loweſt ſtring of a ſpinnet, or even of a violoncello, but by means of their conſonant upper octaves.

Theſe remarks ſeemed pertinent in this place, not only that the reader may have the pleaſure of obſerving the perfect agreement between the nature of ſound, and the choice of the human ear; but alſo becauſe ſeveral modern theoriſts have not hit upon the true cauſe of the multiplicity of ſound.

80. The ſameneſs of effect of the different arrangements and inverſions of this perfect chord, taken notice of in Part I. Art. 133 to 136, is to be accounted for by obſerving that we eaſily ſubſtitute the octaves above or below any ſound inſtead of the ſound itſelf, or we mentally carry any ſound ſome octaves higher or lower, upon occaſion; and thus we form the natural arrangement of the perfect chord in imagination, though the real ſounds of the chord which we hear be differently ſituated.

81. The implied ſounds, ariſing from the differences of vibrations, do alſo contribute, in the moſt part of theſe caſes, towards forming the idea of the perfect chord. Thus, when the ſingle great third and fifth are joined with the fundamental, and conſequently the ſounds of the chord are repreſented, in ſmall numbers, by 4, 5, and 6; the difference between 4 and 5, and alſo that between 5 and 6, generate 1, or the double octave below the fundamental 4; and the difference between 4 and 6 generates 2, or the ſingle octave below the ſame fundamental.

Again, in the inverted chord, called the *chord of the ſixth* upon the third of the fundamental as baſs, repreſented by 5, 6, and 8; where the fundamental is carried an octave higher, and made the uppermoſt ſound, the difference between 5 and 6 generates 1, or the triple octave below the fundamental 8; that between 6 and 8 generates 2, or the double octave below the ſame fundamental; and that between 5 and 8 generates 3, or the octave below 6, which is the fifth to the fundamental.

If the loweſt ſound of the ſame inverted chord be depreſſed another octave lower, the chord will then be repreſented by 5, 12, and 16: in which caſe it becomes much leſs harmonious, both becauſe the fundamental great third, repreſented by 5, is farther removed from its natural place, and alſo becauſe the difference between 5 and 12 generates 7, which is an unſatisfactory ſound, as obſerved, Art. 78; and the difference between 5 and 16 generates 11, which is an unnatural ſound: and although theſe generated ſounds are leſs perceivable, becauſe the relation of the ſounds themſelves is leſs ſimple than before, yet ſtill they contribute ſomething towards the imperfection of the chord.

Thus alſo in the inverted chord called the *chord of the ſixth and fourth*, upon the fifth of the fundamental as baſs, repreſented by 3, 4, and 5; the difference between 3 and 4, and alſo that between 4 and 5 generate 1, or the double octave below the fundamental 4; and the difference between 3 and 5 generates 2, or the ſingle octave below the ſame fundamental. If the middle ſound or fundamental of this inverted chord be carried an octave higher, the chord will then be repreſented by 3, 5, and 8; in which caſe it becomes more harmonious, becauſe the difference between 3 and 8 generates 5, and the difference between 5 and 8 generates 3, ſo that theſe generated or implied ſounds are the very ſame which really exiſt in the chord; while the difference between 3 and 5 generates 2, or the double octave below the fundamental 8. Theſe conſiderations may ſerve to account for the effects taken notice of in Part I. Art. 138.

82. To aſcertain the nature and effect of any two combined ſounds, it ſeems neceſſary, in all caſes, to conſider theſe three particulars. (1.) The formation of the parcel of each ſound. (2.) The ſimplicity of the ratio, or the ſmallneſs of the numbers by which the interval between the two given ſounds may be expreſſed. (3.) The implied third ſound, ariſing from the difference of vibrations of the two given ſounds, which difference may be doubled and redoubled, when neceſſary, in order to bring the implied ſound as near as poſſible to the other two, and to obſerve what kind of chord reſults, at laſt, from all the three.

For example, the interval of a perfect fifth is expreſſed by the ratio of 2 to 3; aud on account of the ſmallneſs of theſe numbers we may ſafely conclude that the terms of a fifth are concord to each other; but we cannot determine which of the two ought to be eſteemed the fundamental without conſidering the formation of each parcel; from whence we immediately obſerve, that as 2 is ſimpler than 3, ſo the lower term of the fifth has always a ſimpler parcel than the upper term, becauſe this latter involves 3 in place of 2 of the former, whatever be the other factors which enter equally into both parcels, therefore the lower term naturally takes place as the fundamental: and this concluſion is farther confirmed by obſerving, that the implied ſound, repreſented by 1, is always the octave below the ſame lower term.

Thus alſo the interval of a fundamental great third, 4 to 5, is a concord, becauſe of the ſmallneſs of the numbers; and the lower term is the fundamental, becauſe it is ſimpler than the upper, and becauſe the implied ſound is the double octave below the ſame lower term: but the interval of a perfect fourth, 3 to 4, reſpects the upper term as a fundamental, becauſe here the upper term is ſimpler than the lower, and becauſe the implied ſound is the double octave below the ſame upper term.

Again, the interval of a ſuperſtructed leſs third, 5 to 6, is alſo eſteemed a concord, though in a more imperfect degree; but here the implied ſound, repreſented by 1, is not the octave of either of the terms, but being brought near by doubling and redoubling, becomes 4, *viz.* the fifth below the upper term, and the fundamental great third below the lower, and this implied ſound is itſelf the fundamental.

In all caſes it may be obſerved, that when the difference of the vibrations of two ſounds, expreſſed in their ſmalleſt numbers, is 1, or 2, or 4, the implied ſound, repreſented by that difference will always be the fundamental, on account of the ſimplicity of its parcel, whether it be or be not the octave of either of the given ſounds.

83. Hitherto we have examined only the ※ perfect chord and its parts, whoſe places in the ſyſtem of modulation may be ſuppoſed well enough known to the reader. It will not be improper here to ſubjoin the ſcheme, in order to exhibit more clearly the ſituation of the other chords which remain to be examined.

SCHEME of the SYSTEM of MODULATION of C.

N°																						
1	IV.	*t.g.*	V.	*t.l.*	VI.*ſ.d.*	VII♭.	*t.r.*	K.	*t.g.*	II.	*t.l.*	III.*ſ.p.*	IV.	*&c.*	Scale of the adjunct fourth.							
2	32.		36.		40.	42.	45.	48.	50.	54.		60.	64.		72.		80.	84.	90.	96.	100.	108.
3	F.		G.		A.	b♭.	B.	C.	c※.	D.		E.	F.		G.		A.	b♭.	B.	C.	c※.	D.
4					Medial			48.		54.		60.	63.		72.		81.		90.	96.		
5	Scale of the prin. Key							K.	*t.g.*	II.	*t.l.*	III.*ſ.d.*	IV.	*t.r.*	V.	*t.g.*	VI.	*t.l.*	VII.*ſ.p.*	K.	*&c.*	
6					Final			64.		72.		80.	84.		96.		108.		120.	128.		
7			G.	g※	A.		B.	C.		D.	d※.	E.	F.	f※.	G.	g※.	A.		B.	C.		D.
8			48.	50.	54.		60.	63.		72.	75.	81.		90.	96.	100.	108.		120.	126.		144.
9			V.	*t.g.*	VI.	*t.l.*	VII.*ſ.d.*	K.	*t.r.*	II.	*t.g.*	III.	*t.l.*	※IV.*ſ.p.*	V.	*&c.*		Scale of the adjunct fifth.				

84. Beſides the explanations of this ſcheme, given, Art 63 and 67, it may be uſeful here to add the following, *viz.*

(1.) Each of the three ſcales in the ſyſtem has a grave fourth and an acute ſixth in reference to its own key; tho' this circumſtance does not fully appear in the adjunct ſcales of the ſcheme, becauſe the degrees of theſe ſcales are all denominated from their relations to the principal key. Thus the VII♭ is naturally and immutably a grave fourth in reference to the IV, as a key; and the II is naturally an acute ſixth, in the ſcale of the IV, Nº 1, 2, 3. Again, the grave K is a grave fourth, and the acute III is an acute ſixth in reference to the V, as a key, Nº 7, 8, 9. And it will be very convenient for the reader to familiarize the compariſons of each degree of the principal ſcale with both the adjunct keys, in order to enter fully into the meaning of this ſcheme, and of what we have farther to add in regard to the nature and conſtitution of chords. He ought alſo to fix in his memory the altered, or *occaſionally tempered* degrees which belong to each ſcale, theſe not being any way diſtinguiſhed in written muſic, nor known but by a nice attention to the different effects of the ſame note in different occurrences, on many of our modern inſtruments. Thus the ſcale of the adjunct IV brings in a perfect IV, and a natural VI, beſides the VII♭; though this laſt is the only altered note which appears in our muſic; while the ſcale of the principal K takes a grave IV, and an acute VI; and the ſcale of the adjunct V introduces a grave K, and an acute III, beſides the ※IV which takes place in our written muſic.

(2.) It muſt alſo be well remembered, that the epithets *grave* and *acute*, which we here annex to certain degrees of the ſcale, do not at all import, that ſuch degrees are to be depreſſed or elevated in an *unnatural* or forced manner: they only ſerve to diſtinguiſh the different ſounds of notes, which are apparently the ſame, on different occaſions, according as one or another of the three ſcales takes place at the time. Thus the grave IV and acute VI, in the ſcale of the principal key, are as natural as the perfect IV and natural VI, in the ſcale of the adjunct IV; and ſo of others: and if it ſhould ſeem improper to denominate one ſtate of theſe variable ſounds *natural*, when the other ſtate is aſſerted to be equally natural in its proper place, let it be obſerved, that we have choſen theſe epithets with a view to conform, as near as poſſible, to the language of muſicians, and to the ſcale formerly eſtabliſhed by theoriſts. We alſo gain another advantage by this application of the terms *grave*, *natural*, and *acute*, viz. that the real quantities of the *occaſional temperament* are thereby eaſily remembered, as obſerved in the firſt and ſecond paragraphs of Art. 71.

We now proceed to examine the proportions of other chords.

85. The chord of the 7th, with a greater third, which is the leading chord of every perfect regular cadence, is produced by admitting the ſound which divides the module into 7, along with the other harmonics of the perfect chord, as already explained. This chord is alſo the production of the natural conſonances of a muſical ſound, as obſerved, Art. 79; for the coincidence at every ſeventh pulſe is ſufficient to render this added ſeventh perceivable; and Mr. Rameau, in his *Generation Harmonique*, acknowledges, that he diſtinguiſhed it among the reſt, but calls it a loſt ſound [*ſon perdu*]. But however *loſt* it may have been to the theoriſts, the practitioners have not failed to make great uſe of it, and to reliſh its effect very highly. This added ſeventh, in a leading chord, naturally reſolves by falling into the third of the following chord. Thus the leading chord of the regular cadence on the principal key conſiſts of the V, VII, II, and grave IV, which, taken in the numbers of the principal ſcale, intitled *final*, *viz.* the 6th line of the ſcheme, and reduced, become 4, 5, 6,

and 7, reſpectively. The ſame may be obſerved of the K, III, V, and VII♭, which form the leading chord to the adjunct IV, taken in the numbers of the 2d line; and alſo of the II, ※IV, acute VI, and grave K, which form the leading chord to the adjunct V, taken in the numbers of the 8th line.

86. We have alſo the ſame kind of chord upon the III of the ſcale leading in a regular cadence on the ſubſtituted VI as a key; ſee Part I. Art. 200: by joining together the III, ※V, VII, and II; with this difference only, that here the II, ſtanding as an added ſeventh to the III *f.* ought to be repreſented by 70, inſtead of 72, as in the 6th line of the ſcheme; or elſe the proportions of 4, 5, 6, and 7, which belong to every perfect leading chord, will not take place; the conſequence of which is, that the II, in this occurrence muſt either be depreſſed below its natural place, in the proportion of 35 to 36, by way of *accidental temperament*, or, at leaſt, its parcel muſt be conceived as formed of the factors 7 x 5, in order to reconcile this chord to the imagination: and it is very probable, that the difficulty of conceiving ſuch a parcel, as obſerved, Art. 65, is the only reaſon why beginners in ſinging find it much harder to join a ſeventh to the leading chord of a flat than to that of a ſharp ſeries.

87. The ſame chord alſo occurs again in each of the adjunct ſcales, taking juſt the ſame degrees, in reference to the keys of theſe ſcales, as that above mentioned does in reference to the principal key. Thus the VI, ※K III and V, form a leading chord to the II, as ſubſtituted ſixth in the ſcale of the adjunct IV, *viz.* the 2d line of the ſcheme; and the VII, ※II, ※IV, and VI, form a leading chord to the III, as ſubſtituted ſixth in the ſcale of the adjunct V, *viz.* the 8th line of the ſcheme: but as each of theſe requires the note which makes the added ſeventh to be *accidentally* tempered, like the II in the preceding article; and as ſuch temperament is found very difficult, even in the ſcale of the principal key, where the greateſt liberties can be taken, it would be extremely difficult, in an adjunct ſcale, unleſs the key of that ſcale were really taken as a *new key*, for the time; we therefore conclude, as in Part I. Art. 200. that the key muſt effectually be changed, and the IV, or the V, muſt be received as a new key, before either of their ſubſtituted ſixths can be introduced as ſuch.

88. In regard to the VI note, which we have all along called the ſubſtituted VI, as being made the principal key of a flat ſeries without introducing any change in the ſcale, except the ※V and tempered II, which are properly only *accidental* alterations; ſee Part I. Art. 200, *& ſeq.* It muſt be obſerved, that this is always the acute VI of the ſcale; and that the principal chord of the flat ſeries, which we call the ♭P chord, Part I. Art. 139. conſiſts of the acute VI, the K, and the acute III of the ſcale: concerning which chord the following particulars muſt be obſerved.

(1.) This chord is not to be found in any one of the ſcales in the ſyſtem, but takes its fifth note (*viz.* the acute III) from the ſcale of the adjunct V, while the third note, (*viz.* the K) belongs to the ſcale of the principal key, and the fundamental note, (*viz* the acute VI,) belongs indifferently to both theſe ſcales. This is one inſtance of a chord formed by the intermixture of two ſcales, which may be ſuppoſed to divide our attention at that time, as obſerved, Art. 45. and hence it appears, that the flat ſeries is really a mixture of two ſcales, and its key note is a ſound partly ſixth and partly ſecond. See Part I. Art. 34, 257, 261, and 262.

(2.) The proportions of this chord, taken in the numbers of the ſcheme, in the 8th and 6th lines, are 54, 64, and 81; the two firſt of which reduce to 27 and 32, but no lower; and the firſt and laſt reduce to 2 and 3, *viz.* a perfect fifth. The largeneſs of the numbers 27 and 32 has induced all former theoriſts to conclude the interval expreſſed by them to be a *falſe*, or diſcordant leſs third; and ſuch a concluſion would be inconteſtible, if the perfection of a concord were always to be truly eſtimated by the ſmallneſs of the numbers, or the frequency of coincidence of its terms: but this is not the caſe, for the implied ſound, as we have already ſeen, muſt be taken into account; and it is more than probable, in regard to the ſimplicity of the ratio, which is another neceſſary circumſtance, ſee Art. 82. that a ratio may be *ſimple* or intelligible to the muſician, if its two terms be ſufficiently ſimple and eaſy to be conceived, though not reducible into very ſmall numbers. However this be, we find by experience, that the principal key of the flat ſeries is really the acute VI of the natural ſcale; and that the K of the ſcale, when it is taken as a fundamental leſs third above this VI, is not perceivably altered in its pitch, like the other occaſionally tempered notes, but only becomes a *diſregarded* ſound, for the time, and therefore we conclude the fundamental leſs third of the flat ſeries to be repreſented by 27 to 32, and not by 5 to 6, as has been ſuppoſed by all writers on this ſubject; in defence of which material innovation we obſerve,

(3.) That the proportion of 27 to 32 generates 5, which, by doubling, becomes 20; that is, the acute VI and K, when heard together, generate the III, which we take as a perfect fifth to the ſame VI, and on that account the VI becomes a fundamental. I ſay, "we take it as a perfect fifth," becauſe it is nearly ſo, being only deficient by a comma. Were the K to make 32 vibrations and one ſixteenth part, for 27 of the VI, the implied ſound would become 20 and one fourth, or 81; *viz.* the acute III, which is the perfect fifth of the key of the flat ſeries: and in this caſe, the proportion of the key to its leſs third would be 432 to 513, which reduces to that of 16 to 19. Now 16, 19, and 24, are probably the very proportions which ſtrike our ſenſe on hearing the ♭ P chord, though at the ſame time we do not ceaſe to regard the key and its third as conſiſting of 27 and 32 vibrations or parts reſpectively, agreeable to their natural conſtitution in the ſcale: ſo that the third of the flat ſeries becomes a diſregarded ſound, becauſe the parcel 19, which it partly aſſumes at that time, is not eligible, neither can be received into muſic otherwiſe than with reſpect to the implied ſounds; that between it and the key of the ſeries, repreſented by 3, being the perfect fifth of the ſeries; and that between it and the fifth, repreſented by 5, being a fundamental great third to the key: but if our attention be in any degree fixed on the ſame leſs third, it immediately becomes the principal key of the ſyſtem, agreeable to its natural conſtitution.

(4.) This ſuppoſition is further confirmed by obſerving, that as the VI of the ſcale is never conſtituted a key without the aſſiſtance of the ♯ V, either in the chord immediately preceding, or in that following; ſo this ♯ V being a fundamental great third to the III, and the III being taken as an acute III, in order to its being the perfect fifth to this key, the ♯ V of conſequence ſeems to bear to this key the exact proportion of 15 to 16, like the VII and K of the ſharp ſeries. Now, this proportion being both more ſimple and more familiar to us than that of 25 to 27, is eaſily perceived, tho' the latter is the true proportion; ſo that the paſſage from the ♯ V to the VI, and *vice verſa,* naturally inclines us to give ſome attention to 16 vibrations of the VI; and this imperfect and diſtant reſemblance between the keys of the two different ſerieſes probably firſt gave riſe to thoſe ſudden tranſitions from the ſharp to the flat ſeries, and contrariwiſe, upon the ſame key, taken notice of in Part I. Art. 256: it ſeems alſo to have ſuggeſted the joining of a ſharp third to the final chord of flat harmony, called by the French, *la tierce de Picardie.* At the ſame time we are not to ſuppoſe that a new module is really adopted containing 16 vibrations or parts of the acute VI, when the flat ſeries is introduced, but only that the abovementioned proportions are perceived as *accidentally* taking place, while the module continues the ſame as in the ſharp ſeries. In ſhort, the flat ſeries is juſtly reputed a kind of impoſition or *trick* put upon the hearer, to make him acquieſce in a concluſion which is not in itſelf the moſt natural.

(5.) That the key and the leſs third of the flat ſeries are not in the proportion of 5 to 6, or not conceived as ſuch, may be infered from theſe conſiderations. If they were conceived by the proportion of 5 to 6, the implied ſound, repreſented by 4, would inevitably preſent itſelf to the imagination along with 5 and 6; that is, the leſs ſixth of the ſeries would always take place along with the key and its leſs third; and further, this leſs ſixth would be eſteemed the fundamental, according to Art. 82; and the leſs third, having a ſimpler parcel than the key, would therefore attract the greater part of our attention: how widely different theſe circumſtances are from the truth no one need be told who has read this treatiſe, or indeed who has any ſenſibility of the effect of muſic. Several other arguments might be brought in defence of this *new proportion* aſſigned to the fundamental leſs third, which we here omit; preſuming, that if truth be on its ſide, we have ſaid enough; and if not, too much.

89. Thus far we have treated only of ſuch chords as are really *fundamental* chords, in the ſtricteſt ſenſe of the word; but there are ſeveral other chords which enter into our harmony, which we have alſo called by the ſame name, as conſiſting of a fundamental, and its third and fifth, though the attention is not ſo entirely placed on the fundamental ſound. Of this ſort is the chord of the IV of the ſcale, leading in a gradation on the V, Part I. Art. 210. and the chord of the II, with its leſs third, leading in an imperfect cadence on the ſame V. The IV in this gradation is always a grave IV, and accompanied with the acute VI, (being its redundant great third,) and the grave K, (being its perfect fifth.) Now, tho' the perfect fifth always generates the octave below its lower term, yet the redundant great third, 7 to 9, generates 2, or the double octave below the intermediate tone 8; and the deficient leſs third 6 to 7, which lies between the upper term of this third and the fith, generates 1, or the triple octave below the next ſuperior tone 8: that is, though the grave K in effect doubles the grave fourth, yet the acute VI, joined with the ſame grave IV, generates the V; and the ſame VI, with the grave K, generates the II of the ſcale; ſo that the V and II of the ſcale being eſſentially implied in this combination, it follows, that this chord has a dependence on, and connexion with the chord of the V. and this, in all probability, is the reaſon why the muſicians have generally repreſented this chord as derived from that of the V, and ariſing from the ſeventh, ninth, and eleventh of the ſame V.

In like manner, the chord of the II *f*, conſiſting of the II, grave IV, and acute VI, has been found, by the artiſts, to bear ſome relation to the ſame V; and has therefore been eſteemed as its fifth, ſeventh, and ninth: the reaſon now appears to be, becauſe the V is the implied ſound in both of the thirds which conſtitute this chord.

90. The only chord which has the leſs third 5 to 6 below the great third 4 to 5, or which, according to our method of deſigning chords, has a ſuperſtructed leſs third below a fundamental great third, is the chord of the III *f*, conſiſting of the III, V, and VII of the ſcale; and here the attention, inſtead of being wholly fixed on the III as fundamental, as it ought to be, if this were really the ♭P chord of the key of the flat ſeries, is partly carried away to the V of the ſcale, and partly to the key, as co-exiſtent fundamentals. Such a multiplicity of fundamentals claiming our attention at once, is a ſufficient reaſon why this chord ought to be ſeldom uſed; and accordingly it is but rarely found in the compoſi-

tions of the beſt maſters, except in paſſages where it is taken as an attempt to paſs into the new key of the ſubſtituted VI, counteracted, by retaining the natural V in the accompaniment. See Part I. Art. 214.

91. It appears then that we have no leſs than three different ſorts of chords, each conſiſting of a fundamental with its leſs third and fifth, and two ſorts conſiſting of a fundamental with its great third and fifth; which differences are entirely owing to the differences of the thirds, as deſcribed above: for every fundamental fifth is to be ſuppoſed perfect; and this affords us a quite new and extenſive proſpect of varieties in harmony, which, if found upon impartial trial to be real, will deſerve a more minute ſurvey.

The public is deſired to conſider what we have here attempted as a kind of rough draught of a deſign, which we are in ſuſpenſe whether to finiſh or caſt away, till their judgment ſhall aſcertain its deſert.

This being the caſe, we ſhall not here pretend to ſay whether there may not be yet other ſorts of chords ſometimes admitted, different from any of the above, or their inverſions: for, though it ſeems pretty clear, that the generality of chords belong to one or another of theſe ſorts, yet it is not impoſſible but that other proportions may be perceived, and eſpecially in the ſubſtitutions uſed in flat harmony, by way of *accident*, ſomething ſimilar to what is obſerved of the principal chord of this ſeries, in Art. 88. N° 4.

It is for the ſame reaſon, and to avoid the cenſure, often too juſtly due to the propoſers of new ſyſtems, of forcibly deducing every thing from a favourite principle, that we have omitted to aſcertain the ſmalleſt interval which can be a *concord*, from the principle of implied ſounds; though it is very probable that as an interval of three octaves is known by experience to be too large to be conceived without ſome intermediate ſound, ſee Part I. Art. 126. ſo no combination ought to be eſteemed a concord, however ſimple and eligible its terms may be in every other reſpect, if the implied ſound be three octaves, or more, below the lower term; and this excludes the interval of a greater tone 8 to 9, and every other leſs than this, from the claſs of concords; and alſo ſhews us why the diſcord neceſſarily becomes greater, as the ſounds approach nearer, becauſe the implied ſound becomes more and more remote, till their difference be ſo inconſiderable that they paſs for uniſons.

It is alſo very probable, that the ſame principle of implied ſounds may be the reaſon why the more perfect concords ought to be below, and the leſs perfect above, in a chord; and why an interval, which is concord in the upper parts, is often no concord when taken in the baſs: for if we lay it down as a rule, that the implied ſound of a concord ought always to be within the limits of audible ſound, and that the loweſt audible ſound is an octave below the FF of the baſs, ſee Art. 25; it will follow, that if the lower term of a fifth be below FF; or the lower term of a fundamental great third below F, the baſs cliff line, theſe intervals will ceaſe to be concords. After the ſame manner might the ſituations of all other concords be aſſigned, but we ſhall not inſiſt on theſe particulars at preſent.

92. If this theory be received, the imperfections of the organ, and all inſtruments conſtructed on the principles of a ſemitonic ſyſtem of fixed ſounds, will become much more conſpicuous than they have hitherto been. It muſt immediately appear ſurprizing, that ſuch great thirds as are tuned exactly in the proportion of 5 to 4, do not prove quite intolerable, in ſituations where we conceive them by the proportion of 9 to 7. The ſame may be ſaid of the leſs third 6 to 5 in ſituations where we conceive its terms by the proportion of 7 to 6: as in theſe occurrences the error of the interval is 36 to 35: Art. 72. N° 1 and 2, which is a complete quar-

ter of a tone. And although by tuning the fifths ſomething too ſmall, which the nature of the ſyſtem renders inevitable, and alſo the great thirds a ſmall matter too large, which many muſicians have thought eligible, theſe errors are every where diminiſhed; yet as all the diſlocation or *temperament* which the ear can allow in a fundamental great third, or even in a fifth, does not exceed a quarter of a comma; ſo no remedy for the abovementioned errors can be obtained by any ſcheme of tuning. And yet for all this imperfection, joined with all others, which ariſe from theſe principles, or have been obſerved by former theoriſts, the organ exhibits a delightful variety of fine harmony; though it muſt be acknowleged, that the variety is much greater, and more ſtriking in a concert of violins, *&c.* whoſe ſounds are variable at the diſcretion of the performers.

93. Shall we then venture to ſay, that on attending to the harmony of a well-tuned organ, where theſe redundant and deficient thirds cannot really exiſt; as for inſtance, in the key of C natural, we do not admit any idea of ſuch proportions; but conceive every great third by the proportion of 5 to 4, and every leſs third by that of 6 to 5, to which they nearly correſpond? The fallacy of ſuch an aſſertion would be too glaring; for if the idea of the proportion of 6 to 7, have place no where elſe, yet it muſt certainly exiſt between the II and IV of the ſcale, when this latter comes in as an added ſeventh in the leading chord of a final cadence on the key; and the falſe fifth between the VII and the ſame IV is undoubtedly taken as 5 to 7: and accordingly this proportion of the falſe fifth has been aſſigned by ſeveral late authors; though the conſequences neceſſarily reſulting therefrom, and which we have endeavoured to trace out in this Eſſay, have not been attended to. In the ſame leading chord, when the VI is alſo joined, as an added ninth, the proportion of 7 to 9 muſt unqueſtionably exiſt between the IV and VI. Now, if theſe proportions could not be received into organ muſic, the conſequence would be, that added ſevenths and ninths ſhould be totally excluded in the leading chords of regular cadences in compoſitions for that inſtrument; but this is far from being the caſe, and the effect of ſuch added diſſonances is much the ſame on the organ as with violins.

94. The moſt ſatisfactory ſolution of this difficulty is got by obſerving that the leſs ſimple any ratio is, the leſs ſollicitous we are concerning the juſtneſs of the terms between which that ratio is conceived to exiſt; and conſequently although octaves, fifths, and fundamental great thirds, are obliged to be nearly juſt before we acquieſce in them; yet leſs thirds of all kinds, falſe fifths, redundant great thirds, *&c.* may differ widely from the true proportions, and yet paſs without offence; though at the ſame time the nearer they approach to the true proportions, the more agreeable is the effect; and this is the only ſuppoſition which will rightly account for our tolerating the *falſe relations* which often inevitably occur in muſic; though perhaps no one ever ſuſpected that errors ſo large as a quarter-tone were thus paſſed over.

Now, to prove, by a familiar inſtance, that errors even larger than this are tolerated in ſome chords of muſic, we need only to obſerve, that from the very nature of the French-horn and Trumpet, the IV of the ſcale of theſe inſtruments really bears to the key the proportion of 11 to 8. (See Phil. Tranſ. N° 195. and abriged by Mr. Lowthorp, vol. I. p. 607.) while the II bears to the ſame key the juſt proportion of 9 to 8. therefore the interval between the II and IV is exactly 9 to 11: and yet this interval, in compoſitions for a firſt and ſecond horn, is very frequently uſed where the ear muſt inevitably conceive the ſounds by the proportion of 6 to 7. Here the difference of the interval really exiſting, from that which is conceived to exiſt, is no leſs than 22 to 21, *viz.* about three eighth parts of a tone; and though it is true, that we perceive this IV to be too ſharp, yet it is alſo true that we are not ſhocked with it, in this occurrence, as we ſhould be with the III, or V, if either of theſe were diſlocated but the third part of the above quantity. In the caſe here inſtanced, it is further to be obſerved, that the whole error of the interval ariſes from the error of the IV, which is ſo much too ſharp, while the II is perfectly juſt; whereas, when an error of a quarter-tone occurs in the organ, it always takes its riſe from two ſmaller errors added together, one of the ſounds being a little too ſharp, and the other a little too flat, at that occurrence; and on this account the error of either of the ſounds will be much more inconſiderable.

95. Though the imperfections of our ſemitonic ſyſtem are by this means ſet in a new light, yet it will appear that the received method of tuning the organ and harpſicord is ſtill the beſt of which the ſyſtem is capable; for we ought to make all our fifths and fundamental great thirds good, if it could be done; but as this is abundantly proved to be impoſſible, and appears very plainly in the ſimple inſtance of the impoſſibility of dividing a perfect octave into three *tolerable* fundamental great thirds; it is beſt to make eight of the moſt accuſtomed great thirds good, and let the remaining four bad ones be between F♯ and B♭, between G♯ and C, between B and E♭, and between C♯ and F, which are leſs uſed: and this may be effected by making all the fifths in the ſcale one fifth part of a comma leſs than perfect, except that between G♯ and E♭, which is leaſt uſed, and which will, by this method, be very bad, being more than a comma and a quarter too large. The good great thirds will be one fifth of a comma greater than perfect, and the bad ones will be a comma and a half too large. And although by tuning the fifths a quarter of a comma leſs than perfect, the good great thirds might be rendered quite perfect, yet the four bad great thirds, and the one bad fifth, would then be larger and worſe. Indeed, if care were taken to compoſe and ſet muſic always in ſuch keys that *theſe* large great thirds might come in, where the proportion of 7 to 9, or that of 64 to 81 were wanted, one might venture to pronounce them perfections rather than otherwiſe, and to aſcertain the beſt method of tuning from our new principles; but as this is not often the caſe, nor likely ſoon to become ſo, we can only obſerve, at preſent, what effect theſe too large great thirds have, when they happen to come in places where the redundant thirds ought to exiſt. Now, the moſt proper keys for ſuch trials are thoſe with three flats at the cliff; *viz.* the ſharp ſeries of E♭, and the flat ſeries of C: for here the great third between the IV and VI of the ſcale, that is from G♯, (now taken for A♭,) to C, is a large great third, on account of the IV being too grave; for the interval from E♭ to A♭ is leſs than a perfect fourth, by as much as the interval from A♭ to E♭ exceeds a perfect fifth, which, in the moſt approved method of tuning, comes very near to the quantity which we have all along called a bearing. Let it then be tried, on ſome ſimple ſtop of a well-tuned organ, whether the note A♭, when it occurs as an added ſeventh to B♭ as fundamental, leading in a regular cadence on E♭ as a key, have not a finer effect than any other ſeventh in the organ; and if it be found preferable, this ſingle inſtance will ſerve to prove the eligibleneſs of the proportions which we have aſſigned, in this Treatiſe, to the leading chord of every cadence. It may be further tried, whether the large great third between A♭ and C be any way offenſive, when theſe two are joined as ſeventh and ninth to B♭; or when they ſtand as third and fifth to F, leading in an imperfect cadence on B♭, as adjunct fifth, in the ſame ſcale of E♭; or when the ſame chord F, A♭, and C occurs as chord of the adjunct fourth, in the flat ſeries of C. In all theſe occurrences, and many others of the ſame kind, the large great thirds were found not only tolerable, but confeſſedly preferable to the perfect fundamental thirds which

occur in ſimilar ſituations, in other keys, according to the judgment of all the expert muſicians whom the author has had opportunity of conſulting: and he earneſtly deſires the moſt ſkilful, into whoſe hands this Eſſay may come, to endeavour to ſatisfy themſelves and the world in regard to the truth of the principles above delivered, by theſe or any other trials, which their knowlege may ſuggeſt as proper and ſufficient.

96. It is not ſo eaſy to preſcribe proper trials whereby the juſt proportion of the fundamental leſs third may be aſcertained, becauſe, as hinted above, the ear is not very critical in regard to this chord, the upper note is a diſregarded ſound, and, as ſuch, may vary greatly from the juſt proportion, before we diſcover any error: but if the implied ſounds, as formerly deſcribed, do really take place, and, if the manner of perceiving the pulſes, by certain eligible parcels, prove to be really the director of the human mind in the choice of muſical ſounds, it ſeems impoſſible to aſſign any other proportion to the fundamental leſs third, than that which is given above, conſiſtent with theſe principles.

97. The ſcale of the organ, tuned as uſual, has nine leſs thirds, each falling ſhort of the proportion of 5 to 6, by about two fifth parts of a comma, and the three other leſs thirds are very near the proportion of 6 to 7; *viz.* thoſe from E♭ to F♯, from F to G♯, and from B♭ to C♯: ſo that the organ does not afford any leſs third in, or near, the proportion of 27 to 32, (or 16 to 19) whereby to make trial whether ſuch a third be more ſatisfactory in the final chord of flat harmony; but yet the trial may eaſily be made by flattening, for the time, that note which makes the leſs third of the ſeries.

98. Before the author came to a reſolution of publiſhing this ſketch of a theory, he made ſeveral accurate trials of the different ſorts of thirds, by the well-known method of putting two ſtrings of the ſame ſize on a violoncello, tuned exactly uniſons, and ſtopping off one of them after the manner of a monochord, by proper diviſions on the finger board; and he found that altho' among the leſs thirds, 5 to 6, is the beſt concord, yet the mind is naturally led to regard the upper ſound rather than the lower. In the leſs third, 16 to 19, the lower ſound inevitably attracts our attention, and the upper is diſregarded. In the deficient leſs third, 6 to 7, the lower ſound alſo prevails, but the upper ſeems dejected and unconcluſive. The ſame dejected effect attends the lower ſound of the redundant great third, 7 to 9: and the great third, 19 to 24, taken without any other accompanyment, is intolerable diſcord; probably becauſe the lower ſound, repreſented by 19, cannot, in this ſituation, be diſregarded, as it would be, if another ſound repreſented by 16 were alſo added. As a farther trial of theſe principles, he alſo publiſhed, ſome time ago, a ſmall collection of Pſalm-Tunes, in parts, with the grave and acute notes marked by accents, according to the view he then had of the matter, of which copies may be had, by applying to thoſe who ſell this Treatiſe.

As the Author has not been ſparing, either of time or ſtudy, in order to diſcover, and publiſh, what appeared to him to be truths of the greateſt importance in the ſcience of muſic; ſo he expects his Work will not be haſtily cenſured, nor condemned, without as fair and impartial a trial as the caſes in queſtion will admit of.

FINIS.